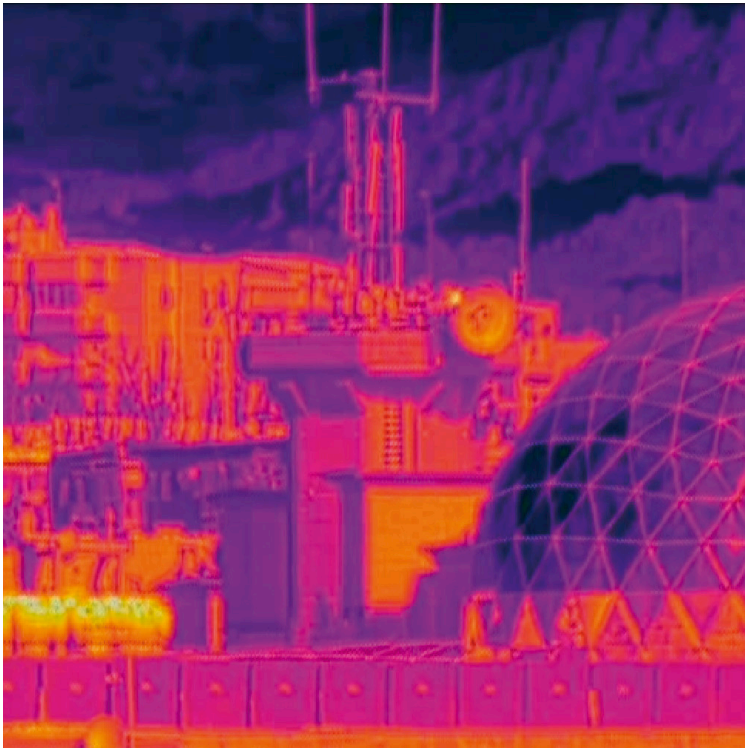
User's manual
FLIR Sensors Manager 2012



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1 Introduction

This manual will help the user getting started with FLIR Sensors Manager (FSM), describing the most common operational steps as well as going through all the advanced features.

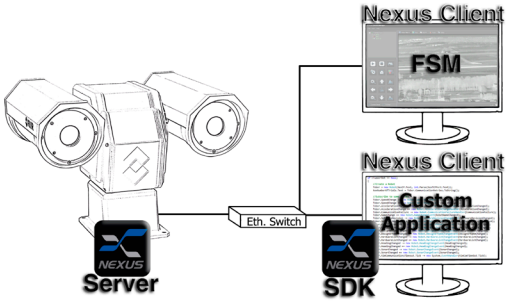
FLIR Sensors Manager offers a user friendly and straight forward interface focusing on usability and situational awareness. While minimizing operator workload, FSM still allows for full control of its complete suite of surveillance and video management capabilities. FSM enables a user to control anything from a single sensor to a complete security network that includes infrared and daylight cameras, radars, nDVRs, ground sensors, etc. FSM is the single point solution for control of security sensors.

This document is based on a specific layout of FSM, which may differ from the actual application, but the components and operating steps are the same.

2 Nexus Technology

Nexus is a plug-and-play connectivity platform that allows management of a wide variety of sensors; from basic sensors to complex networked imaging integrated systems, including radars, DVRs, I/O sensors, ground sensors, etc. Nexus technology is based on three main entities: Sensor Servers, Sensors Client and Development Tools

Nexus Sensor Server	Client
The Sensor Server is connected to the physical devices, turning them into network plug-and-play devices.	The Client is the user interface for interacting in a network of sensors; it could be FSM or a Nexus SDK-based application.



Development Tools

The Development Tools are a group of software components that allow developers to easily code custom applications to manage and control sensors in the network

Map	SDK	Video Player
The Map control provides functions to build a graphical geographic representation of the network.	The SDK provides a library including a set of functions to control the sensors and get their current status.	The Video Player provides functions to play video from different sources and to perform image post-processing and video analysis for surveillance.

3 FLIR Sensors Manager Installation

FSM installation, as any other Windows program, contains the usual steps to follow on the setup process. This section will provide a description of the required steps.

3.1 Minimum Hardware Requirements

To begin the installation process, choose a Windows (XP SP3 or newer) PC or laptop with the following minimum requirements.

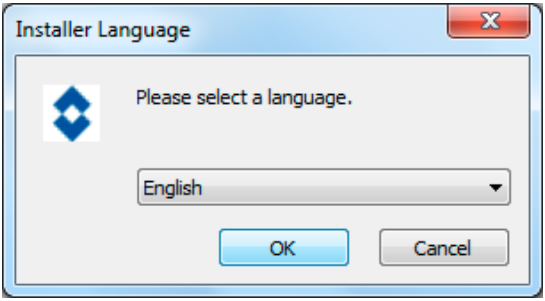
CPU	Intel Pentium Processor IV 3GHz
RAM	1GB
HDD	2GB available
Graphics	1024 x 768 128MB of dedicated RAM Windows DirectX Compatible Real Time Video Overlay rendering capabilities
OS	Windows XP, Windows Vista and Windows 7

Note: These minimum requirements allow users to manage a single Nexus Sensor, display one video and perform some basic video analytics. Please ask a FLIR representative for larger systems.

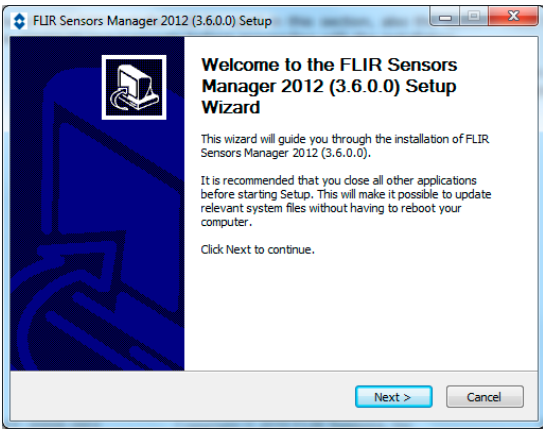
3.2 Installing FSM

The FSM installer will be used in this section. The system must also fulfill the minimum requirements before proceeding with the installation.

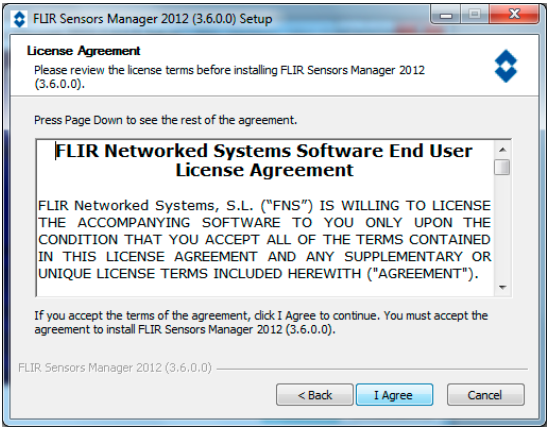
1 Insert the Installation CD and double click on the FSM Setup icon. The Installation Setup window will open. Select the installation language and click OK.



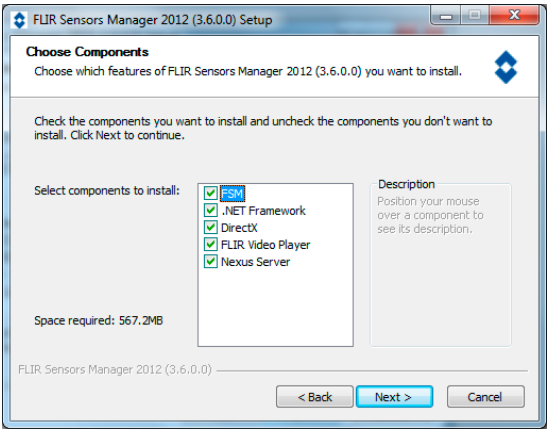
2 The installation will start in the selected language. Click Next to continue


FLIR Sensors Manager 2012 (3.6.0.0) Setup
Welcome to the FLIR Sensors Manager 2012 (3.6.0.0) Setup Wizard
This wizard will guide you through the installation of FLIR Sensors Manager 2012 (3.6.0.0).
It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.
Click Next to continue.
Next >
Cancel

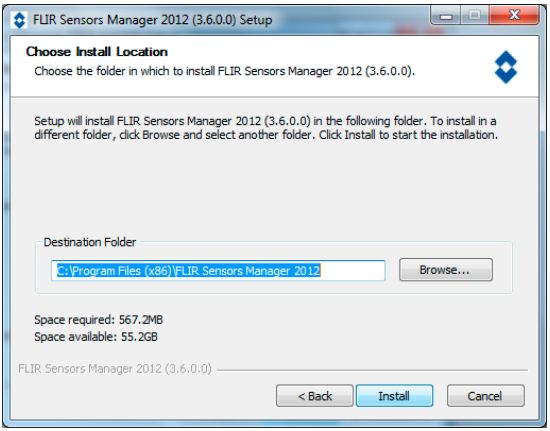
3 Read the License Agreement and click I Agree to continue. In the next screen select the components to be installed. Please note that FSM **may not work properly if any of the components are not installed**. Un checking components from the installation process is not recommended.


FLIR Sensors Manager 2012 (3.6.0.0) Setup
License Agreement
Please review the license terms before installing FLIR Sensors Manager 2012 (3.6.0.0).
Press Page Down to see the rest of the agreement.
FLIR Networked Systems Software End User License Agreement
FLIR Networked Systems, S.L. ("FNS") IS WILLING TO LICENSE THE ACCOMPANYING SOFTWARE TO YOU ONLY UPON THE CONDITION THAT YOU ACCEPT ALL OF THE TERMS CONTAINED IN THIS LICENSE AGREEMENT AND ANY SUPPLEMENTARY OR UNIQUE LICENSE TERMS INCLUDED HEREWITH ("AGREEMENT").
If you accept the terms of the agreement, click I Agree to continue. You must accept the agreement to install FLIR Sensors Manager 2012 (3.6.0.0).
FLIR Sensors Manager 2012 (3.6.0.0)
< Back
I Agree
Cancel

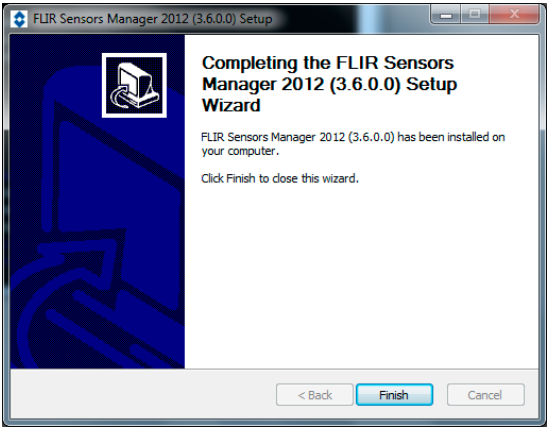
4 When asked to choose the install location, click Install to accept the default location. If a different location is desired, click Browse to navigate to the location, then click Install.


FLIR Sensors Manager 2012 (3.6.0.0) Setup
Choose Components
Choose which features of FLIR Sensors Manager 2012 (3.6.0.0) you want to install.
Check the components you want to install and uncheck the components you don't want to install. Click Next to continue.
Select components to install:
FSM
.NET Framework
DirectX
FLIR Video Player
Nexus Server
Description
Position your mouse over a component to see its description.
Space required: 567.2MB
FLIR Sensors Manager 2012 (3.6.0.0)
< Back
Next >
Cancel

5 The last component to be installed is the FLIR Video Player. Please note that the FSM application relies on this player and it will not work without it.


FLIR Sensors Manager 2012 (3.6.0.0) Setup
Choose Install Location
Choose the folder in which to install FLIR Sensors Manager 2012 (3.6.0.0).
Setup will install FLIR Sensors Manager 2012 (3.6.0.0) in the following folder. To install in a different folder, click Browse and select another folder. Click Install to start the installation.
Destination Folder
C:\Program Files (x86)\FLIR Sensors Manager 2012
Browse...
Space required: 567.2MB
Space available: 55.2GB
FLIR Sensors Manager 2012 (3.6.0.0)
< Back
Install
Cancel

6 Click Next, read and accept the License Agreement and click Next again.


FLIR Sensors Manager 2012 (3.6.0.0) Setup
Completing the FLIR Sensors Manager 2012 (3.6.0.0) Setup Wizard
FLIR Sensors Manager 2012 (3.6.0.0) has been installed on your computer.
Click Finish to close this wizard.
< Back
Finish
Cancel

7 When the installation is complete, click Finish to close the installer.

4 FLIR Sensors Manager Licenses

FSM Licenses are always text strings sent via email or USB dongle devices that enable diverse software features. Section 4.2 below explains the main difference between Text and Dongle licenses.

There are four different licenses to be used in FSM: Demo, Basic , Pro and Enterprise.

4.1 Obtaining the right License

The best way to acquire the right license is asking an official FLIR representative, who will provide the license that better fits an installation after performing a study of each case.

The following table describes each of the 4 different licenses as well as how to obtain them.

License	Description	How to get it
Demo	Default license when the software has just been installed. Perfect for video and control of one sensor in a point to point configuration.	No license required. FSM software on CD/ downloaded from http://ns.flir.com
Basic	Optimized for those installations requiring basic video management functions; networks with up to 10 sensors.	User Registration in FLIR Developers Network (FDN)
Pro	Ideal for installations with up to 100 sensors per workstation, requiring all the advanced features such as Video Analytics, Geo-Mapping functions or Remote Management.	Contact a FLIR sales representative

Features	Demo	Basic	Pro
Discover sensors in the network	X	X	X
Point-to-point Sensor control	X	X	X
Display network video	X	X	X
Define Presets and manage Scan Lists	X	X	X
Create Panoramas	X	X	X
Customizable user profiles	X	X	X
Work on multiple monitors	X	X	X
Capture Images	X	X	X
Video walls and video management tools		X	X
Geo-Mapping			X

Features	Demo	Basic	Pro
Video Analytics			X
eStab (Electronic Stabilization)			X
Radar Cueing / Radar Tracks Display			X
Workstation Status Monitoring			X
User Triggered Alarms			X
Export Video Alarms			X
Number of managed Sensors	1	10	100

4.2 Differences between Text and USB Dongle Licenses

As explained in previous sections, FSM requires a license to have any additional functionality. These licenses are distributed in two different ways: as a Text file or in a USB Dongle device.

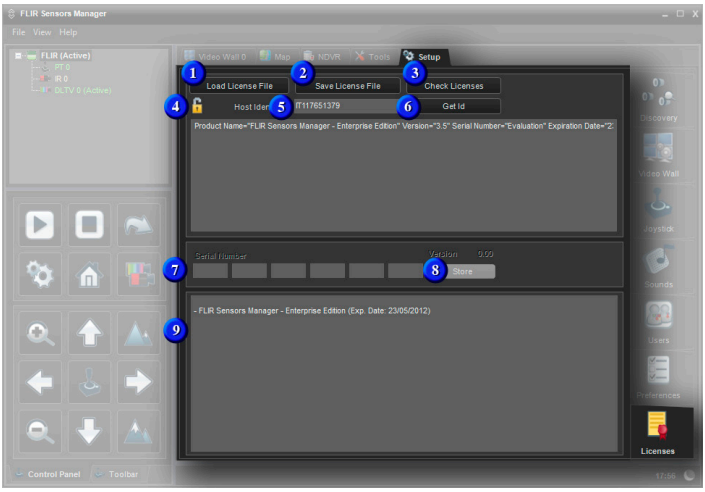
There are some significant differences between these two licensing systems:

Characteristics	Text Licenses	Dongle Licenses
Computer-bounded	Yes, based on IT number which is hardware-dependent.	No
Can be used in any computer	No, it can only be used on the specific computer that it was generated for.	Yes, it can be used in any computer running FSM
Packaging	Text String Sent via email.	USB dongle device coming with FSM package
Available Licenses	Basic Video Security Pro	Pro

4.3 License Manager

The Licenses Section allows the user to set and check the application licenses.

To access this section go to Setup → Licenses section. The image below shows this section and each field is explained in the following table.



#	Field	Description
1	Load License File	Loads a license from a text file.
2	Save License File	Saves the contents of the License Text Box to the License file.
3	Check Licenses	Checks the available licenses and displays the results in the Licenses Info field.
4	Lock License Text Box	Locks the license text box so users cannot modify the license unless clicked again.
5	Host Identifier	Tags the computer with a unique hardware-dependent. It is also known as IT number.
6	Get ID	Refreshes the Host Identifier field in case of any hardware changes.
7	License Textbox	Displays the current license string in use. If FSM runs in Demo mode this field will be empty.
8	Dongle Info	Displays the dongle information when a USB dongle device is present.
9	Store Dongle Info	Stores the new information provided by a FLIR representative containing the new license.
10	License Info	Displays the result of the licenses check.

4.3.1 Upgrading Text Licenses

Once a new FSM text license is received, it will have to be added to the software. This can be done either by importing the text license string from a file (typically a plain text file) or just copying the strings into the License Text box (item number 6 from the table above) and saving it by clicking on the Save License File button.

4.3.2 Upgrading Licenses in a USB Dongle

If a FLIR representative provided a license update for the USB dongle, it must be updated using this panel.
Follow these steps to upgrade a dongle license.

1 Six alphanumeric character groups will be provided by a FLIR representative.
2 Type or copy and paste those characters in the Dongle Info fields (item 7 from the table above)
3 Click the Store button to save the new data in the USB dongle.

4.3.3 License checking

Once the license has been updated following the described procedures from sections 4.3.1 and 4.3.2, it is a good practice to check whether the software recognized the new functionalities or not.

To check the current license, simply click the Check Licenses button (item 3 from the table above) and make sure the license shown is the expected one in the License Info textbox (item 9).

4.3.4 Invalid Licenses

As described before, the licenses are based on the Host Identifier which is a hardware-dependent number. If the network cards configuration changes, this number might also change making the current license invalid.

This usually happens in laptop computers where the Wireless card can be turned on and off.

Please contact a FLIR representative if your IT has changed.

5 FSM Interface

As explained in section 1, FSM is the single point solution for controlling one or several sensors in security installations of any size. Depending on these installations, FSM may be used as a basic software tool with just the most common features, or it may become an advanced tool making use of sophisticated video processing algorithms or high-level cartography functionalities.

This section includes all the basic operations needed in any installations such as discovering and adding sensors, customizing a video wall or working with Scan Lists.

All the functions described in this chapter will be also required to take advantage of all the advanced functionalities of FSM.

5.1 FSM Startup User Interface

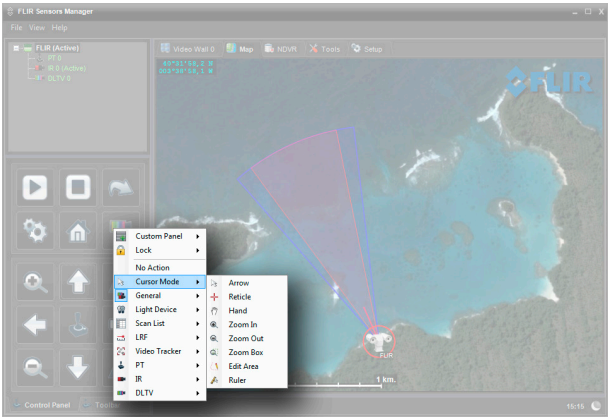
When FSM is launched for the first time, it will look like the following image. Below is a brief description of each basic component of the user interface.

#	Control Name	Description
1	Title Bar	Contains the Name of the Software and brings some window options when right-clicking on it
2	Menu Bar	Allows the user to save a Profile, view a Video Wall, open a Panorama, see the software version, etc.
3	Sensors Panel	Shows the current added sensors. Right clicking on a sensor from this list will bring more options to manage it.
4	Control Panel/Toolbar	Contains all the controls to manage any compatible device. Moving a P&T, zooming in and out, creating alarm areas for a radar and managing preset lists are just a few of its more than hundred available functions represented as icons.
5	Main Panel	Contains the main tabs such as Video Wall 0, Map, NDVR, Tools and Setup

5.2 Cursor Modes

FSM contains 8 different cursors allowing the user to approach all the functions available.

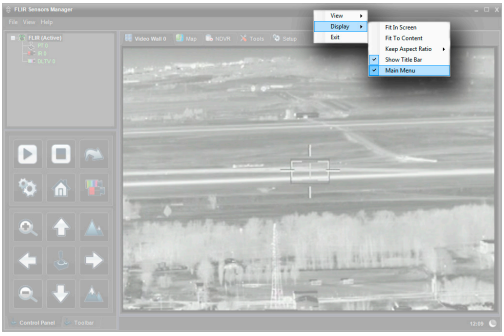
To see all the available cursors and add them to the Control Panel/Toolbar, simply right-click on the panel and go to the Cursor Mode Option as shown below. There an operator can chose which cursors will be available in the current panel.



Cursor	Function	Environment
Arrow	Default cursor with no special functions. Double-clicking a device with this sensor makes it active.	All
Reticle	Allows aiming to a certain spot with a Pan and Tilt camera	Video, Map and Panorama
Hand	Allows moving the background image on the map and panorama and the P&T on a motorized camera.	Video, Map and Panorama
Zoom In	Zooms in the map, video or panorama image	Video, Map and Panorama
Zoom Out	Zooms out the map, video or panorama image	Video, Map and Panorama
Zoom Box	Creates a box that will contain the zoomed image	Map
Edit Area	Create Surveillance Monitoring Areas, Wires and Radar Alarm Areas	Video and Map
Ruler	Calculates the distance to a given point. To set the origin right-click on the Map→View→Ruler→Set Ruler Origin or Shift + Click	Map

5.3 Window Options

Depending on the operator and the station, FSM may be configured with different window options. To access these options, the users should right-click on any FSM window title bar and select the Display option. This action displays a context menu that allows changing the window settings as shown below.



Option	Description
Fit in Screen	Resizes the window to fit in the current screen.
Fit to Content	Resizes the window to fit its content.
Keep Aspect Ratio	Ensures that the selected aspect ratio will be kept after a resize.
Show Title Bar	Hides or shows the top title bar. Ctrl + T will show the window options when this title bar is not visible.
Main Menu	Shows and hides the main menu. This option is available only for the main window.

6 FSM Preferences

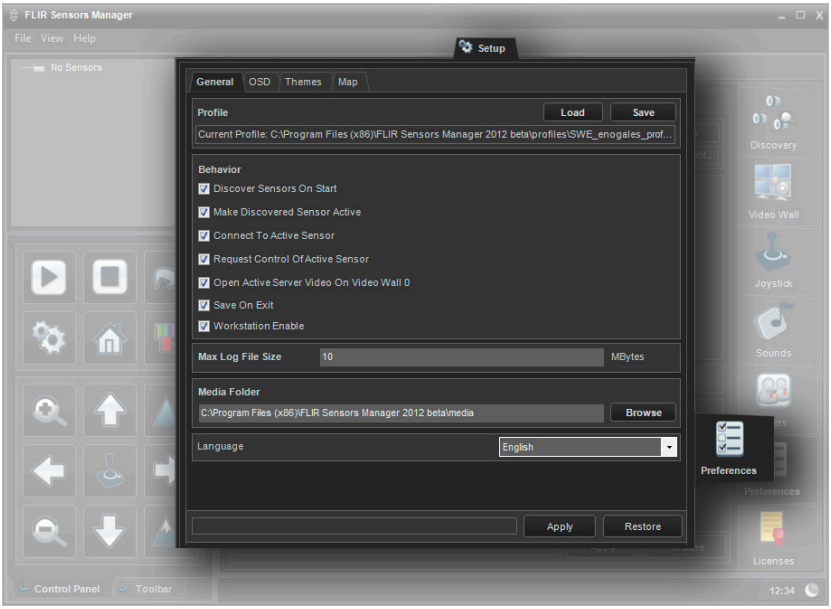
The default way FSM looks and behaves is totally customizable so users can change the aspect, colors, window distribution, language, etc. from the Preferences Tab under Setup → Preferences.
Preferences are divided in three main groups: General, OSD and Themes.

6.1 General Preferences

For ease of operation, FSM is designed to discover, connect, gain control, and open a video into a video wall by simply plugging in the sensor to the network and starting FSM. This is very convenient if the user is working on a one sensor, single user environment, but if the user runs multiple sensors and works in a multi-user environment it might be useful to disable (deselect) the appropriate automated features.

Go to Setup tab → Preferences Section → General tab to find the FSM Preferences.

Once the preferences have been properly customized, click the Apply button at the bottom of the panel and save the current profile by clicking the save button on the upper-right corner or going to File → Save Profile



6.1.1 Profile Section

FSM is able to save a customized layout as well as any user preference and language option. All these settings are saved in a file called Profile.
To learn more about FSM Profiles, please read section 24.

6.1.2 Behavior Section

The following table describes each preference.

Preference	Description
Discover Sensors On Start	FSM will automatically look for sensors in the network on start
Make Discovered Sensors Activel	When there is a single discovered sensor, it will be added to the active sensors list. If a client is on a network with multiple sensors, the user will have to manually add the sensor to the active sensors list
Connect to Active Sensor	Automatically connects to the active sensor in the sensors panel.
Request control of active Sensor	Control of the Active Sensor will be automatically requested
Open Active Sensor on Video Wall 0	When a sensor is made active, the first video stream will be opened on Video Wall 0
Save on Exit	Allows the application to save any changes on the layout and preferences and restore them the next time it runs
Workstation Enable	Enables the connection to the local sensor to provide workstation management functionalities

6.1.3 Max Log File Size

Changing the log file size might be useful in case the user wants to have more data logged or if the system does not have a big hard drive it might be interesting to decrease it.

6.1.4 Media Folder

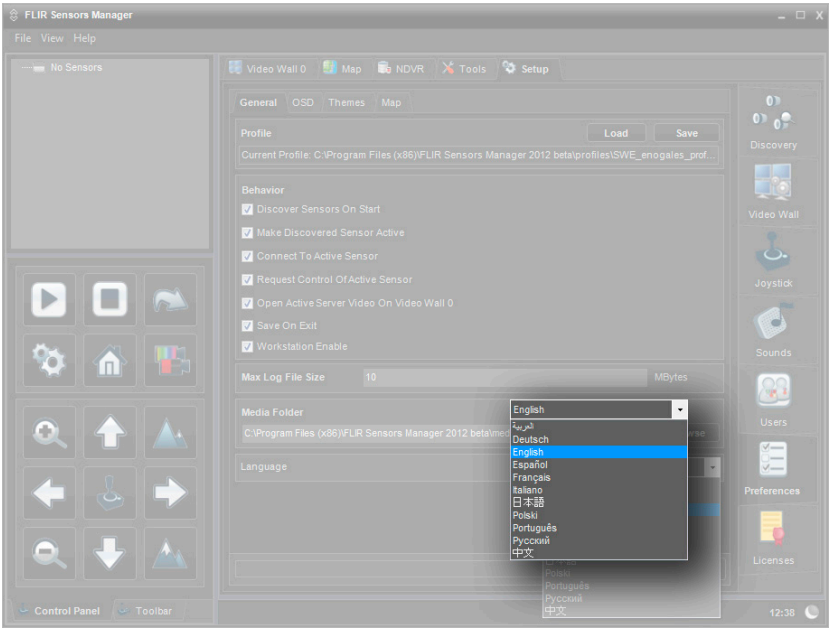
The Media folder is the location where all the media files are saved. Media files are either snaps created by the user or automatically generated by the alarms, or videos downloaded from an nDVR.

Note: FSM will not allow more than 5000 items in this folder in order to prevent the operating system from not working properly and FSM not responding. FSM will also stop creating media files, such as snaps and video, if the hard drive contains less than a 10% of free memory.

6.1.5 Language Section

The Language section allows changing the application's language. FSM supports some of the most widely used languages:

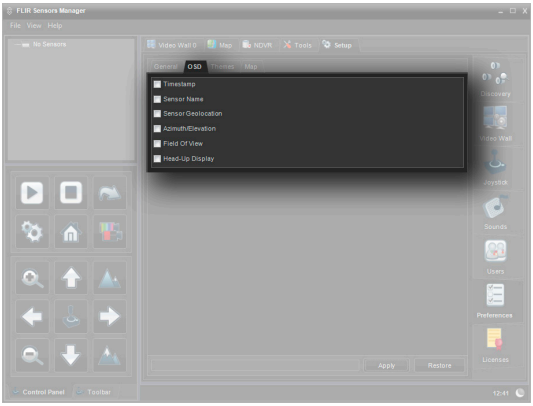
- Arabic
- Portuguese
- Simplified Chinese
- Italian
- Spanish
- Deutsch
- Russian
- Polish
- Chinese
- French
- English



Changes will take effect after restarting FSM.

6.2 OSD Tab

The OSD (On Screen Display) tab allows setting up the default OSD configuration for each video tile created in a video wall.

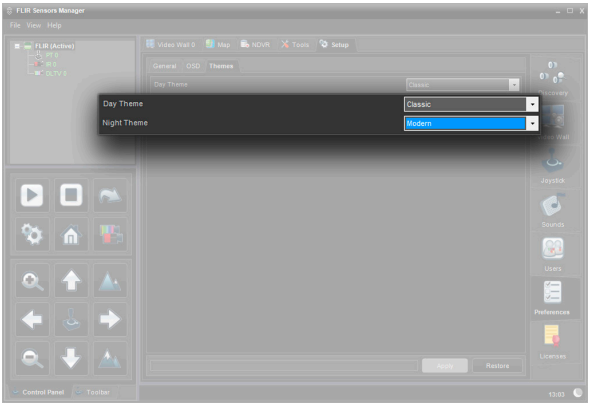


To make a video tile able to display an OSD, it will have to be created with Image Processing capabilities. Check section 15 for more information about Image Processing.

Once these options have been properly customized, all videos tiles with Image Processing capabilities created after applying the changes will show the proper OSD. The following image shows an example of how a video would look like.

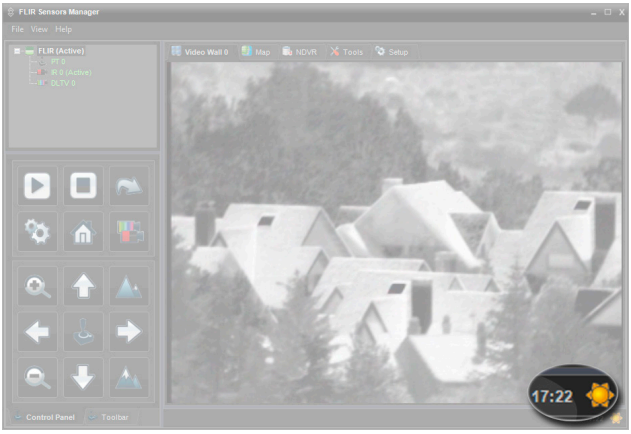
6.3 Themes Tab

FSM includes several themes to be selected for Day and Night use.



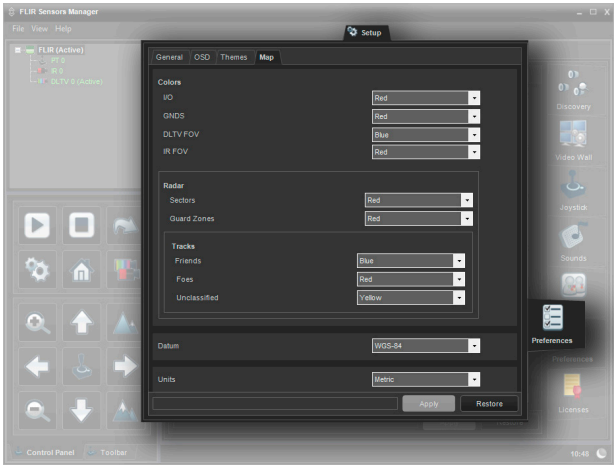
Each theme may be useful depending on the environmental light and the use of FSM. Below are some examples of how FSM may look after applying some themes:

To switch between Day and Night themes, click the Sun/Moon icon on the lower right corner of FSM



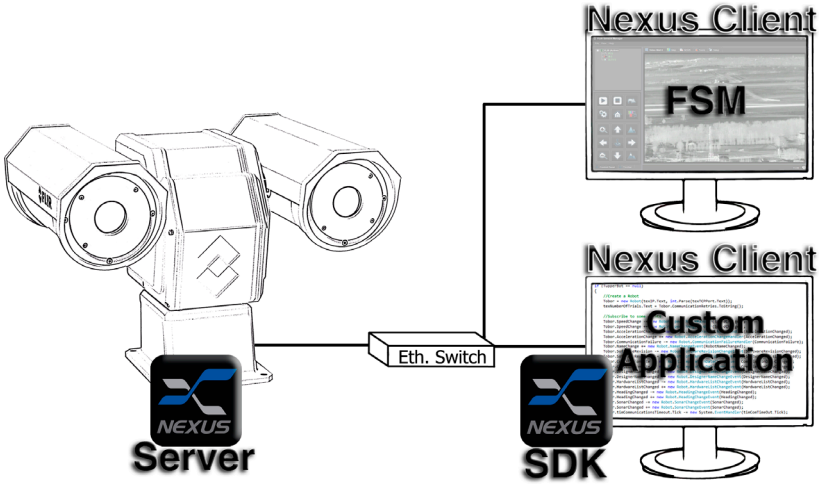
6.4 Map Tab

General configuration parameters for the map such as Colors, Datum or Units can be configured on this panel.



7 Managing Nexus Sensors

FSM works as a client of Nexus Sensor so, in order to start using it, FSM needs to have at least one Nexus Sensor in its Active Sensors List.



7.1 Discovering Nexus Sensor Servers on the Network

The starting up behavior depends on how FSM Preferences are configured. The following sections will assume all the preferences are enabled. Refer to section 6 to learn more about these preferences.

There are three different scenarios when adding sensors: One sensor present in the network, more than one sensor is present in the network and manual addition of Nexus Sensors.

7.1.1 One sensor present in the network

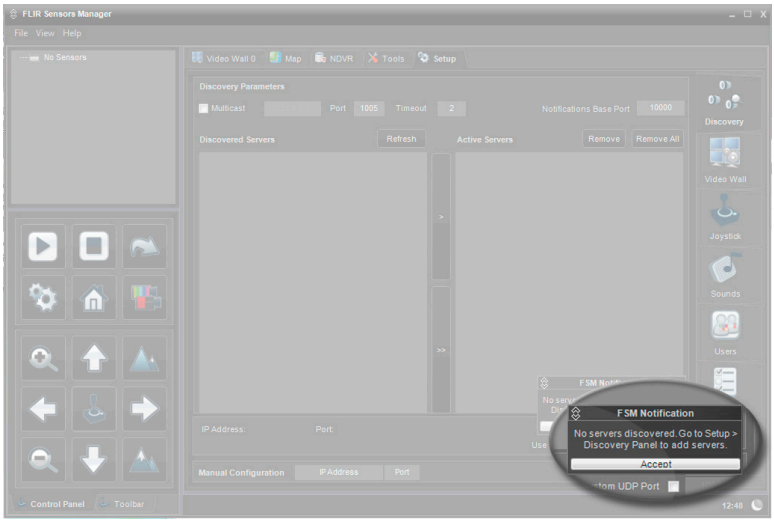
When FSM is run for the first time and a single sensor is connected in the network, the screen will look like the following image.

With the default settings FSM will automatically discover the sensor, make it active, request control and open the first video streamed on Video Wall 0.

7.1.2 More than one sensor present in the network

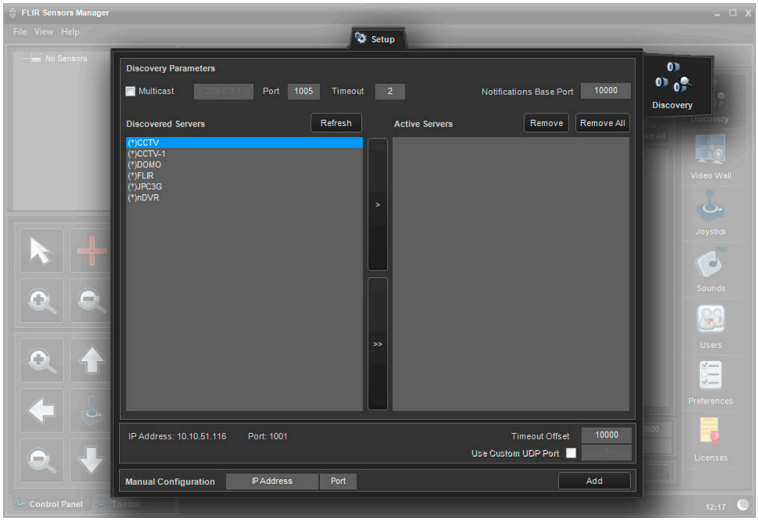
If there is more than one sensor available on the network, FSM will let the user add active sensors using the Discovery panel, so FSM will start up on its empty Main panel.

FSM will warn the user with a notification on the lower-left corner of the screen indicating that no sensors were added.



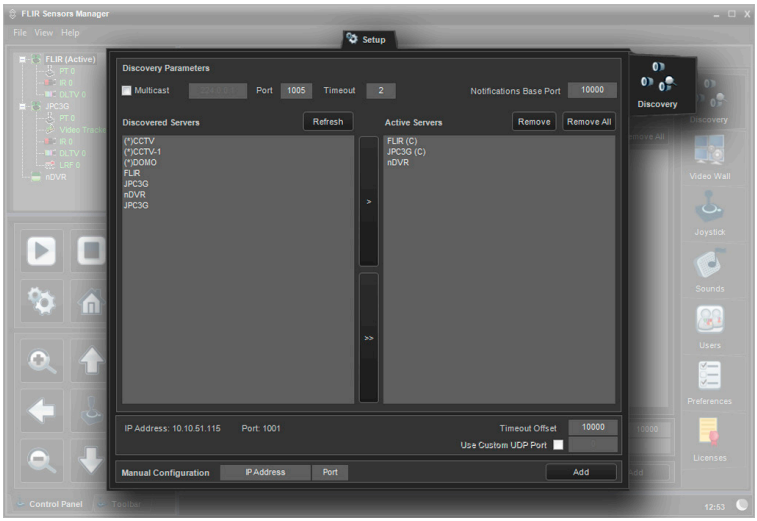
In this case, the Discovery Panel will provide the functionality to add sensors to the Active Sensors Panel.

1 Select the Setup tab → Discovery section



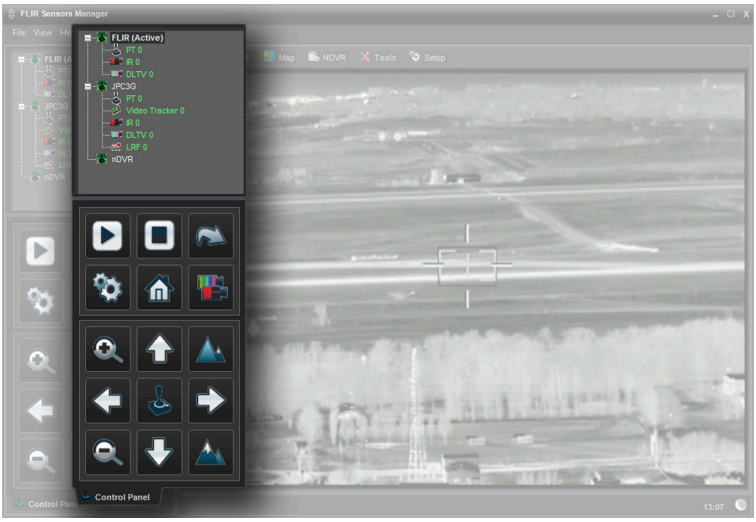
2 The left panel is called Discovered Sensors panel, here you will find every Nexus Sensor connected to your network that allows automatic discovery. Click the Refresh button if this list is empty or not up-to-date.

3 Double click on the sensor or the “>” button to add it. It will become an Active Sensor and will be shown in the Active Sensors list on the left, as well as in the Sensors Panel on the top left side.



4 Once the first sensor is added, it will become the active sensor and its control will be requested, so the sensor icon on the Sensors Panel will go from gray (added but disconnected) to a green icon (connected) with a little joystick in it (under control). Check section 7.2.1 to learn more about sensor status.

5 Only the first sensor will be automatically connected, so if more than one is added, the user will have to double click the gray icon on the Sensors Panel or select the options right clicking on it.



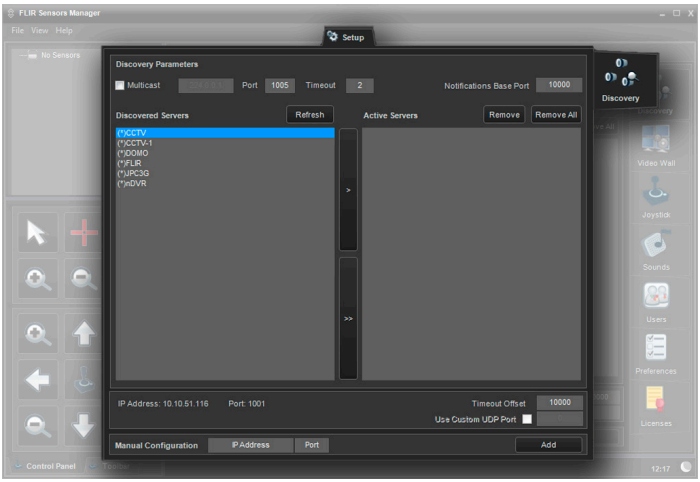
7.1.3 Manual Addition of Nexus Sensor Servers

Sometimes the Nexus Sensors are not automatically discoverable, but FSM can still connect them. In these cases the user will need some information from the sensors to be used and will have to add these sensors manually.

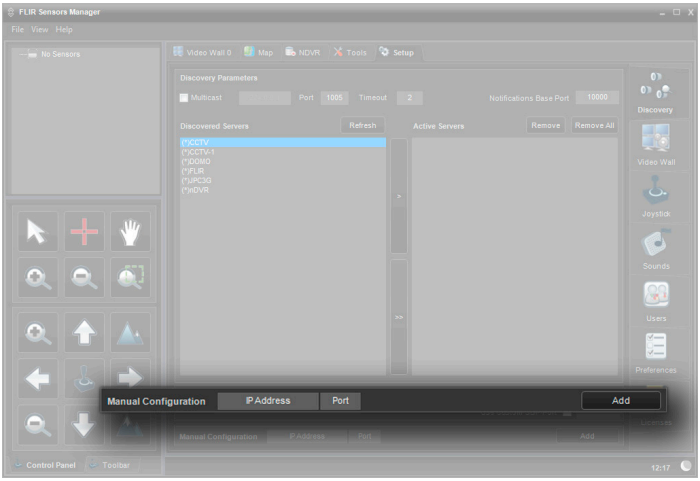
As before, FSM will warn the user with a notification on the lower-right corner of the screen indicating there are no active sensors added.

These are the steps to manually add a Nexus Sensor:

1 Select the Setup tab → Discovery section.

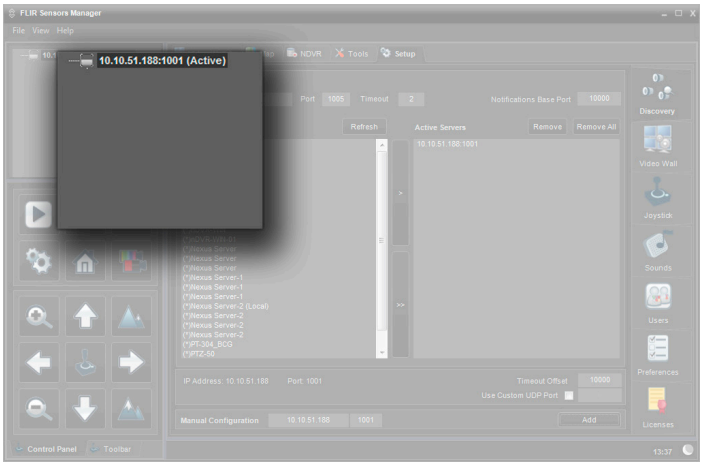


2 The Manual Configuration panel is shown in the lower part of this tab.

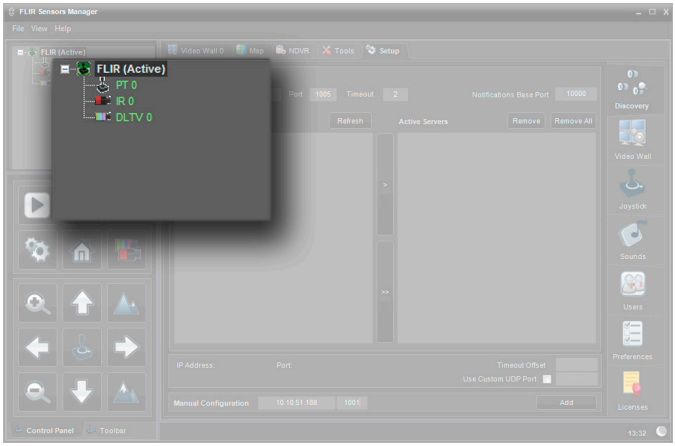


3 Type the IP Address and Port number of the Nexus Sensor to be added.

4 Click the Add button and the new sensor will become an active sensor shown in the Active Sensors list on the right, as well as in the sensors panel on the top left side just with its IP address and port.



5 Double click on its gray icon from the sensors panel or use the context menu (right click) to connect to the sensor, make it active and take control if needed. The name of the sensor will show up instead of the IP once the connection process is completed.



7.2 Sensors Panel

The sensors panel provides information about sensors' status and allows the user to connect to each sensor, get control and send video to any video tile.

7.2.1 Sensor and Device Status

Once the sensor has been connected, its status and the status of all its devices will be displayed.

The following tables describe the meaning of each icon and colors of the Nexus Sensor and its devices.

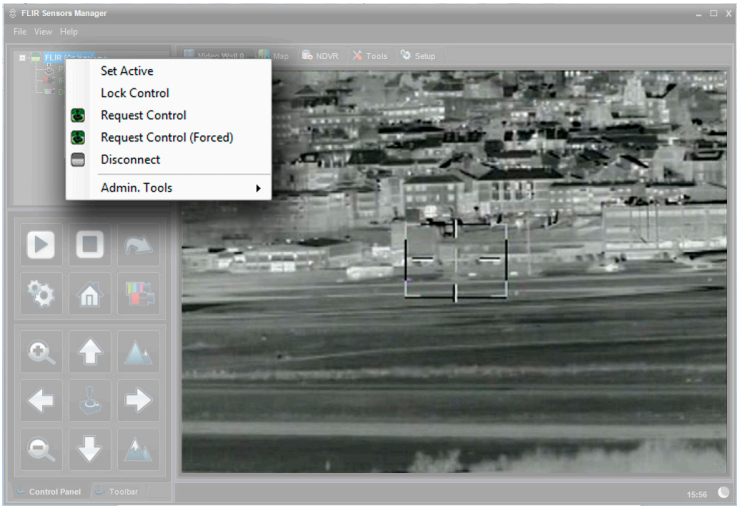
Sensor	Status
	Sensor is Disconnected
	Sensor is Connected
	Sensor is Connected and the user is in Control of it
	Sensor is Offline

Device Status

Name in Green	Communications are OK
Name in Yellow	A command has been sent to the device and the sensor is waiting for a response.
Name in Red	Device is not responding. It is probably disconnected or not well configured

7.2.2 Connecting to a Sensor Server

A connection with a sensor can be established by right-clicking on the sensor name and selecting the Connect option.



7.2.3 Requesting Control of a Sensor Server

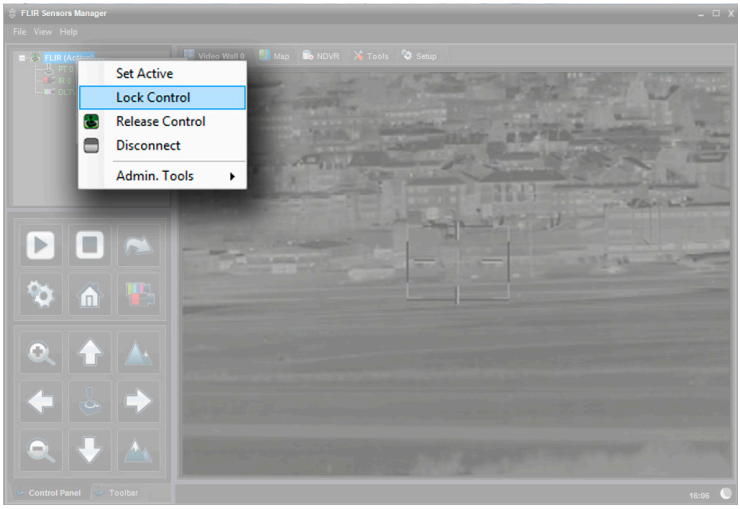
To request control of a sensor and make it active, double click on the selected sever name. A joystick next to the sensor name indicates control has been granted, as shown in section 21.

The control of a connected sensor can also be requested by right-clicking on its name and selecting the Request Control option.

Please note that double-clicking on the sensor requests control over that sensor and automatically sets it as the active sensor.

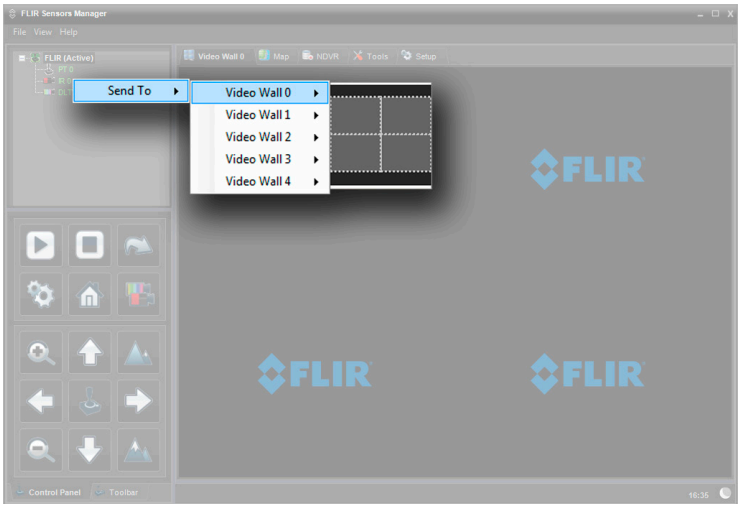
7.2.4 Locking Control of a Sensor

A client may lock control over the sensor by right-clicking and selecting Lock Control. This allows the user to automatically deny all control requests from other clients.

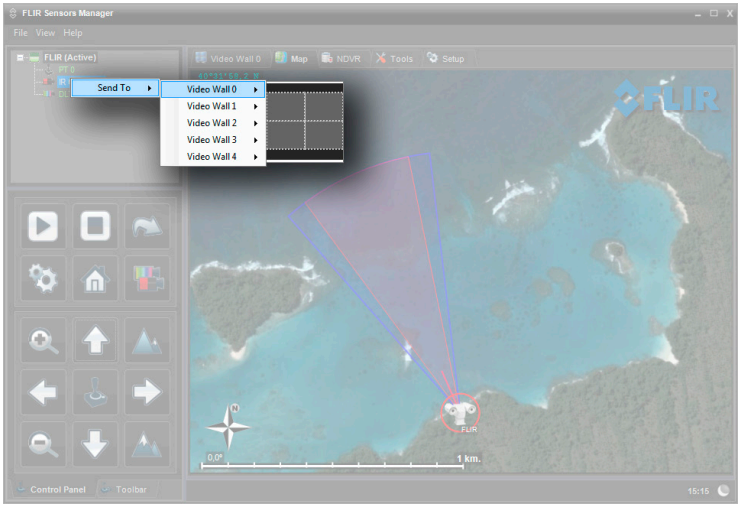


7.2.5 Opening a Video Stream in a Video Tile

Video streams can be opened from the Sensors Panel. An easy and natural way to send the video to a video tile is by dragging and dropping the video device from the Sensors Panel to a visible video tile.

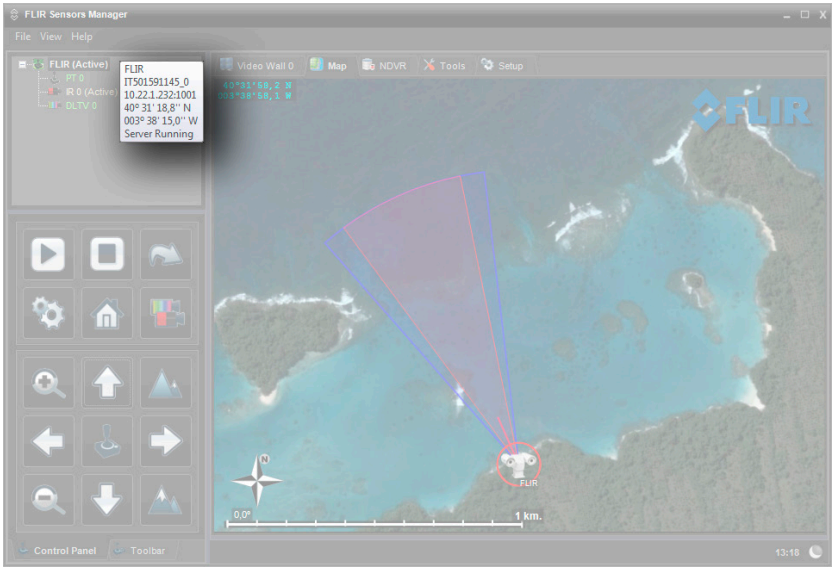


If the target video wall is not visible at this moment, the user can always right-click over a DLTV or an IR device and the Send To menu will show up allows the operator to send that video stream to any video tile in any video wall.



7.3 Getting extra information from the Sensor

Placing the mouse pointer over the sensor displays a tooltip with information of the current sensor such as its IP, port, name, etc.

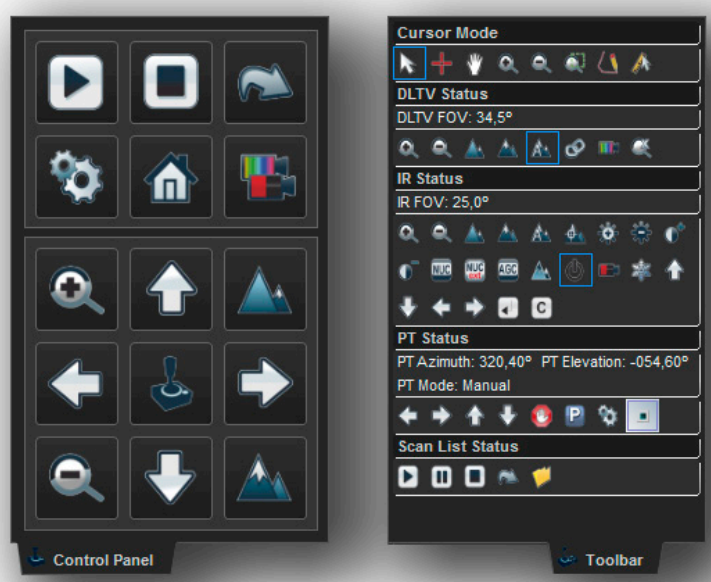


8 Control Panel and Toolbar

In some installations, an operator may be using FSM to move the cameras, acknowledging alarms or even measuring distances to raised alarms on the map.

These situations would require different tools that should be easily accessible to the operator.

As shown in this chapter, users can fully customize these two panels in order to create a personalized group of tools that better fits their needs.



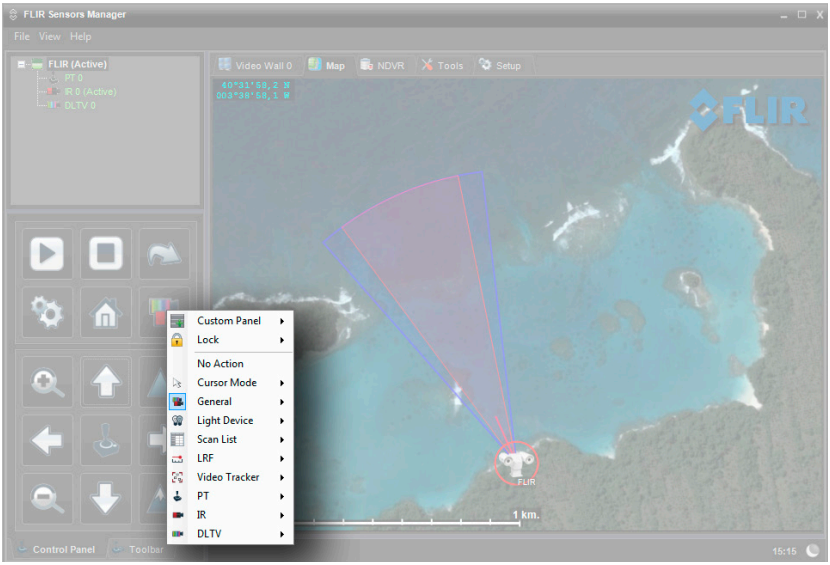
8.1 Control Panel

The Control Panel allows, by default, to perform most common sensor commands such as moving the camera, focusing or zooming in and out. The image below shows the default Control Panel and the following table contains a description of each button.

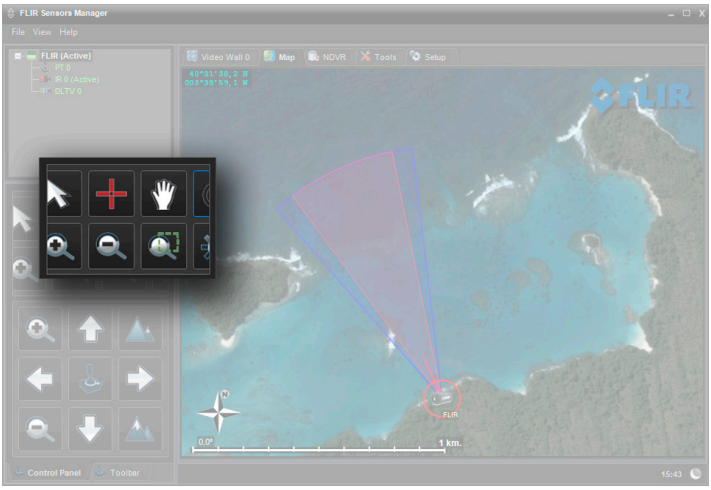
Description
Scan List Start
Scan List Stop
Go To Preset
Initialize Pan and Tilt
Go To / Set (hold for 3 sec) Home Position
Toggle Active Camera
Zoom In
Tilt Up
Focus Far
Pan Left
Show Virtual Joystick (Pad)
Pan Right
Zoom Out
Tilt Down
Focus Near

8.2 Customizing the Control Panel

When more specific functions are needed or the user does not use certain buttons at all, it is possible to right-click on the panel and selecting the appropriate icons as shown below.



It is also possible to access more functions by right-clikcing or dragging any button or clear area with the mouse. The panel will start sliding and showing more icons.



8.3 Toolbar

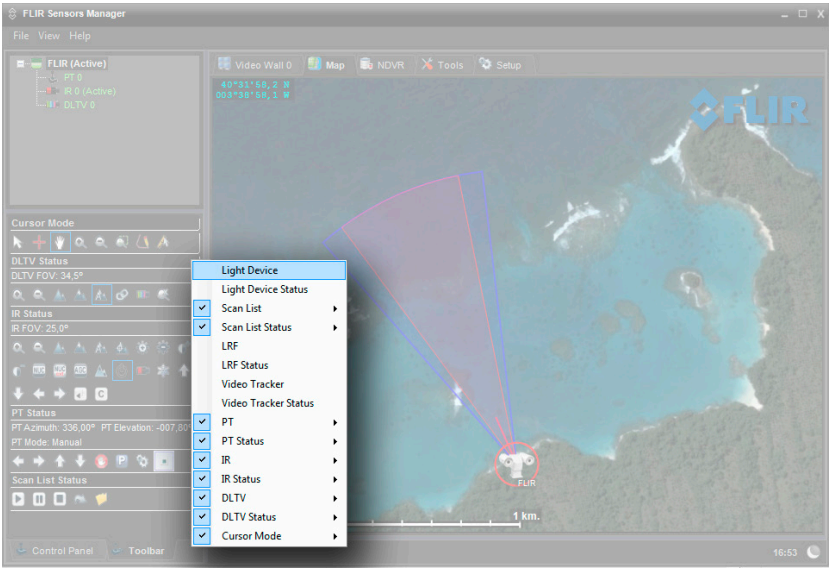
The Toolbar is a more advanced control panel that allows the operator accessing most of the functionality of each sensor. It also contains information about the active sensor such as the FOV, scan list status, last reading of the laser range finder, etc.

The following image shows the default layout of the Toolbar where just some of its sections and icons are displayed. It is highly recommended to customize this panel based on the functions used by each operator.

8.4 Customizing the Toolbar

As explained in the previous section, it is highly recommended to customize each section of the Toolbar so the operator does not have too many buttons not being used there.

Right-clicking inside of the toolbar allows operators to select the appropriate items and customize this panel.



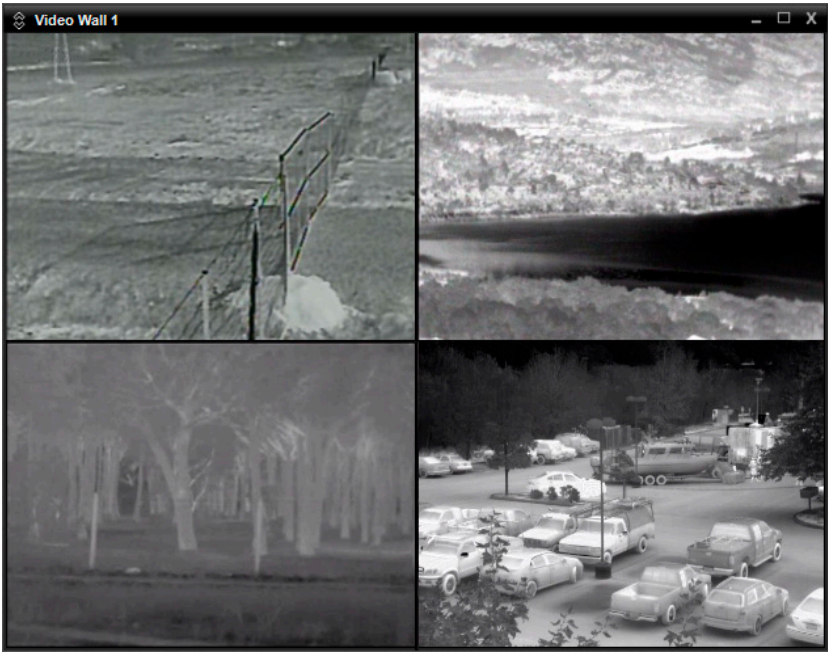
9 Video Wall

One of the core components of FSM is the Video Wall. FSM can handle a wide variety of devices from Radars to IO and Ground Sensors, nDVR, Pan and Tilts and, of course, Thermal and Day Light TV cameras.

This section will show how to setup any video wall with customized video tiles as well as video tile modes.

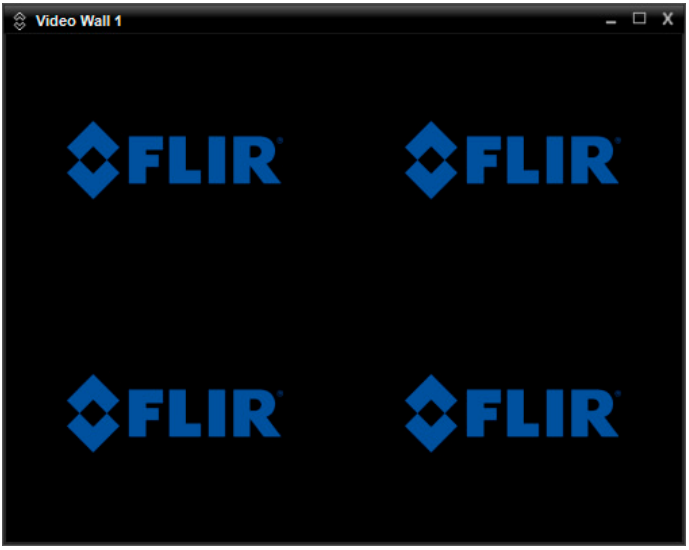
9.1 Video Wall Overview

A video wall is an FSM window where one or more videos are displayed at the same time.



There are 5 available video wall windows; the first one, Video Wall 0, is embedded in the main window as a tab in the main panel. Video Walls 1, 2, 3 and 4 are floating windows that can adopt any size and be moved to any monitor.

All the Video Walls are composed by video tiles. The video tile is the component that holds a Video Player and it can adopt several behaviors such as playing a single stream or performing a carrousel of all the available videos. All these behaviors will be described in the following sections. The following image shows a Video Wall with 4 empty tiles.

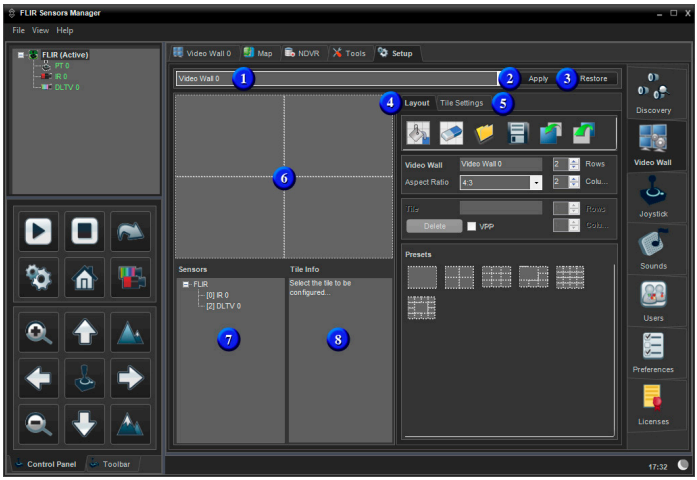


NOTE: When no license is loaded, only one video tile is allowed per video wall.

9.2 Video Wall Setup

The video wall configuration can be displayed by going to the Setup tab →Video Wall.

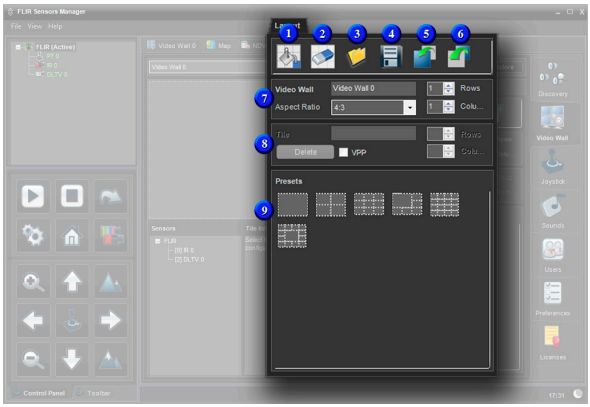
The image and table below describe each section of the Video Wall setup panel.



#	Name	Description
1	Video Wall Selector	Shows the list of the available Video Walls
2	Apply	Applies any changes to the Video Wall Configuration
3	Restore	Restores the current settings of the selected Video Wall
4	Layout Tab	Layout configuration tools.
5	Tile Settings Tab	Advanced Tile behavior settings.
6	Video Wall Preview	A preview of the windows configuration
7	Sensors	List of Sensors
8	Tile Info	Displays information about current tile

9.2.1 Setting up the Video Wall layout

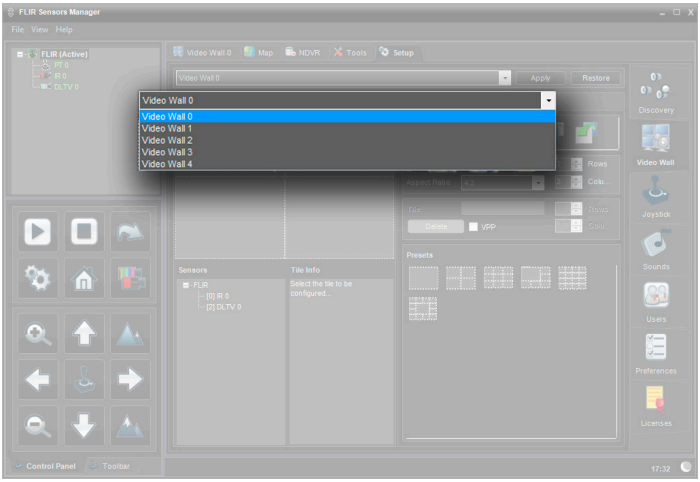
This section explains in detail how to configure the layout of any Video Wall. The following image and table show in detail all the components needed for this operation.



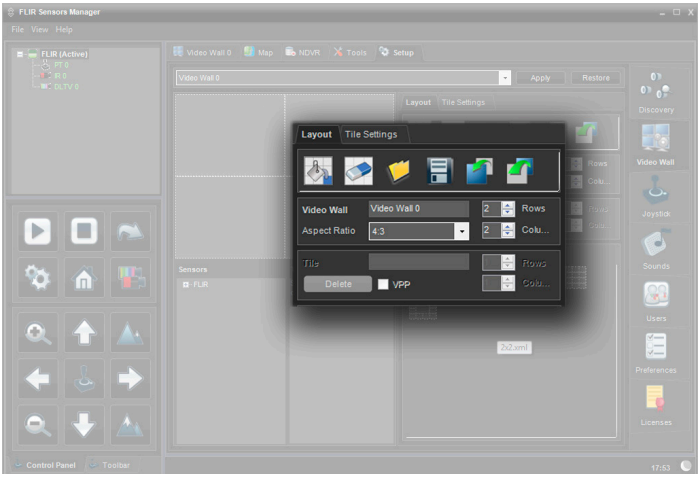
#	Name	Description
1	Fill	Activates all the empty tiles of the video wall
2	Clear	Clears all the tiles of the Video Wall
3	Load	Loads a video wall configuration from a file
4	Save	Saves a video wall configuration from a file
5	Bring to front	Brings the selected tile to the front with respect to a larger tile behind this one. This is especially useful when creating Picture-in-Picture configurations
6	Send to back	Similar to the Bring to front button but sending to back the selected tile
7	Video Wall section	This section contains the name, number of rows, columns and the aspect ratio of the current Video Wall
8	Tile Section	Contains the name, number of rows, columns and Image Processing capabilities of the current Tile
9	Presets	Shows different Video Wall default and user defined layouts to be applied to the current Video Wall

Follow these steps to set up a video wall layout:

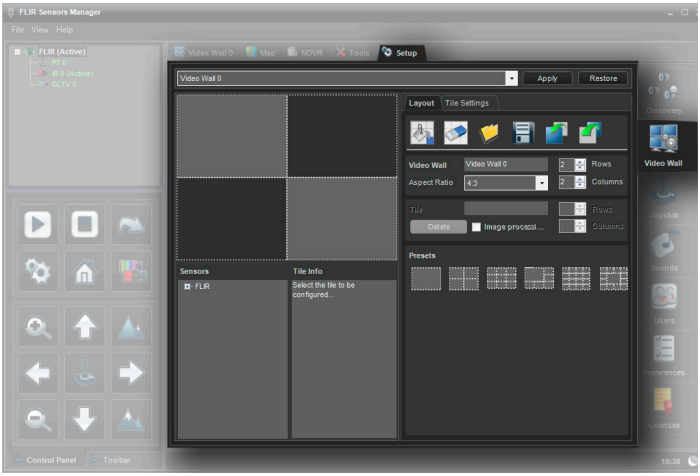
1 Select the Video wall from the Video Wall Selector in the main panel.



2 Go to the Layout tab, give it a name and select the number of columns and rows for that video wall.



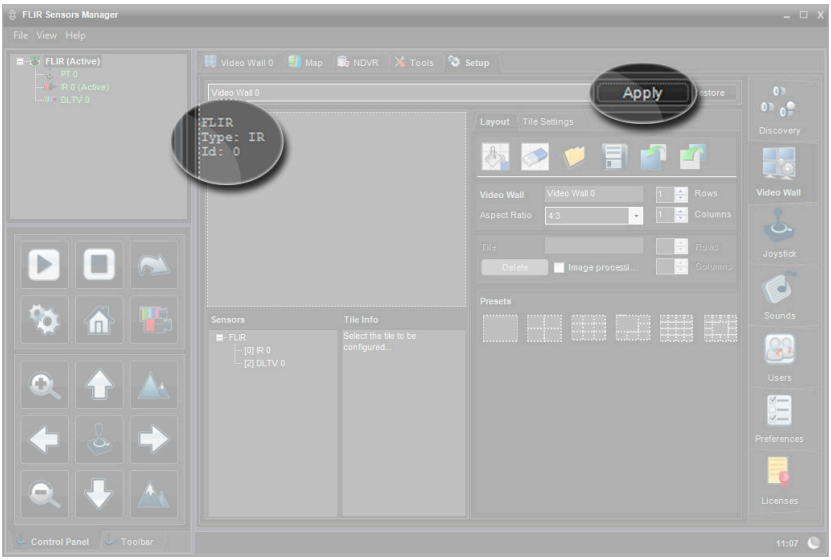
3 If the Video Wall will contain combinations of video tiles, like in this example, it is a good practice to clear the video tiles before starting to change its properties. Once the video tiles are clear they become black instead of gray.



4 Select the tile configuration for each tile. In this example the top left tile is a 2 by 2 while the other 5 are all 1 by 1. Also, the Image Processing can be activated by checking the box in this menu so the current tile will have advanced capabilities such as performing Surveillance monitoring or applying OSD.

5 From the Sensors List, drag and drop each camera to the tile where it will be shown later.

6 Click the apply button and make the Video Wall visible by selecting it from the View menu.



As explained in previous chapters, it is also possible to send videos to the any video tile by simply dragging and dropping any device from the Sensors Panel in the tile.

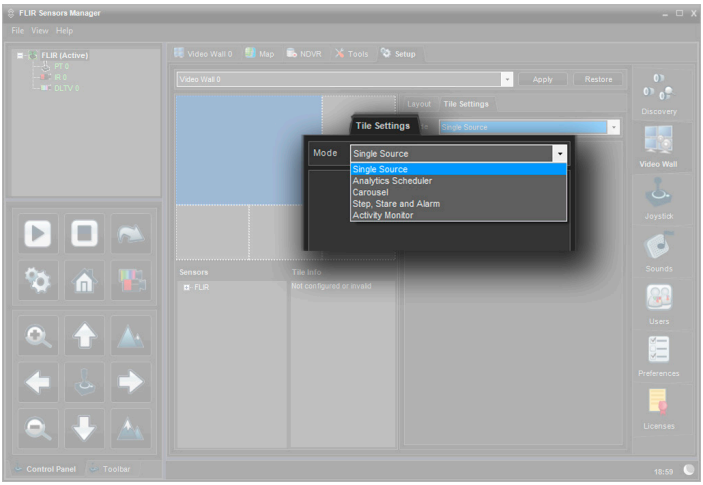
9.2.2 Tile Mode Settings

Visualizing several live or recorded video from FSM is an easy task thanks to the Video Wall configuration. When more complex behaviors are needed, users can set up different Tile Modes.

9.2.2.1 Tile Modes Overview

Tile Modes provide advanced functionality to each tile in the Video Wall like loading different video profiles depending on the time, automatic switching between different video sources, associate video profiles to each point on a presets list, or switching to a specific video source when an alarm is generated.

Tile modes can be found in Setup → Video Wall → Tile Settings.



Here is a description of the different modes for each Tile:

Name	Description
Single Source	Default mode in which a single video source is displayed in the tile all the time
Analytics Scheduler	This mode allows different video profiles to be loaded based on a schedule generated by the user
Carousel	The tile will switch between sources each of which will switch between different profiles based on defined schedules
Step Stare and Alarm	This mode makes use of the running scan list binding each preset to an analytics video profile
Activity Monitor	On an alarm manager event of a sensor or a local analytics alarm, the tile configured in this mode, will show the video stream associated with the alarm

9.2.2.2 Preparing FSM to start working with Tile Modes

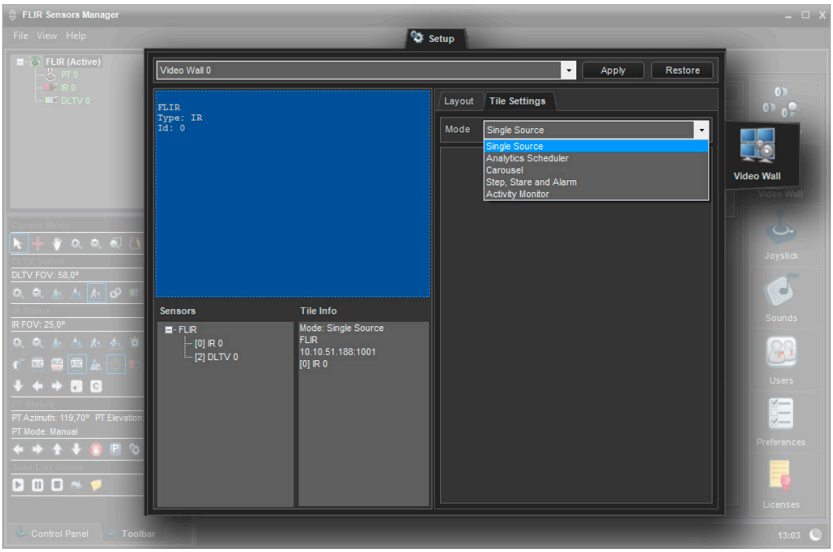
Before getting started with the Tile Modes, FSM needs at least one video source displayed in one of the 5 possible Video Walls. In some cases it will be required to have more than one video source and a Pan & Tilt; this will be specified when needed. It will also require having different Video Profiles saved in order to load them later.

Once the video source is ready and the Nexus Sensor is added to FSM with the control requested, go to Setup → Video Wall, select a tile in the Video Wall and go to the Tile Settings tab to start configuring the Tile Modes.

9.2.2.3 Single Source mode

This is the simplest and default mode of any tile. In this mode, a single source is always shown in the tile.

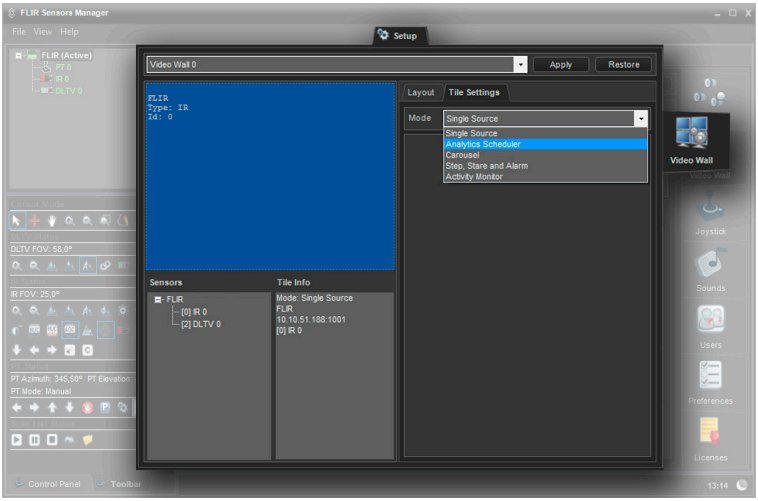
Since this is the default mode, there is no need to follow any special procedure to set it up. Simply drag and drop a video source on the tile and click on apply.



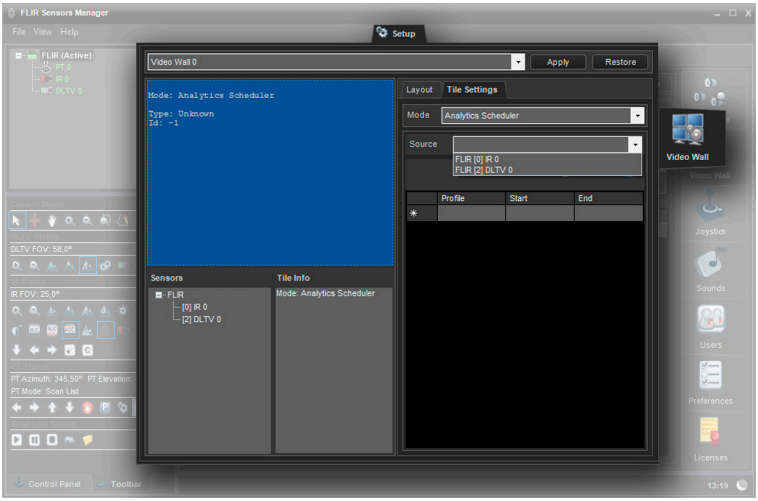
9.2.2.4 Analytics Scheduler mode

In this mode a video analytics profile will be loaded based on a schedule generated by the user.

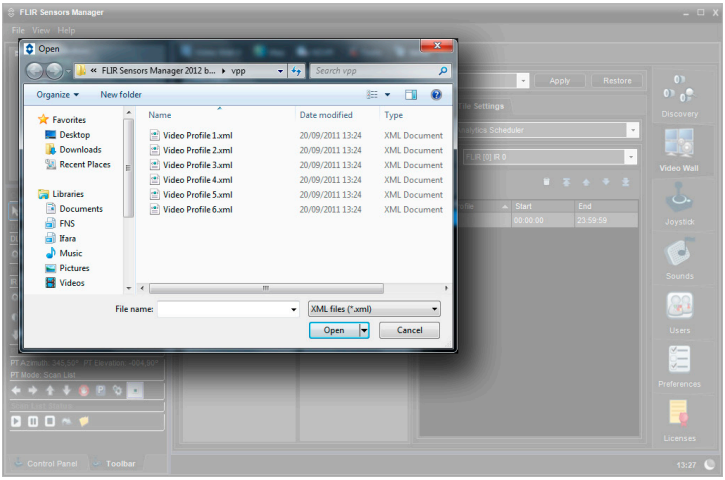
1 To set up a new Analytics Scheduler tile, select this mode from the drop down list and a new table will be shown underneath.



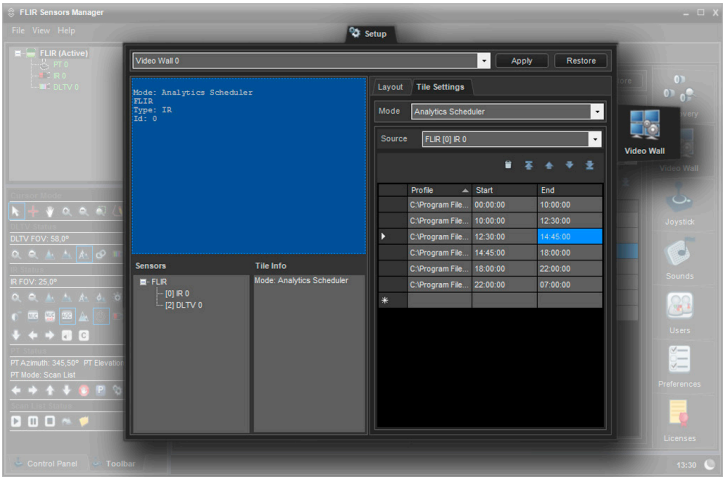
2 Select the video source from the drop down menu.



3 To create the schedule, double click on the cell under Profile, a new window will open asking for a video profile to load.



4 Once the video profile is selected, it is possible to choose a Start and End time for this specific profile by simply typing the time in the cells. Repeat steps 3 and 4 as many times as needed in order to create the complete schedule, and finally click the Apply button.

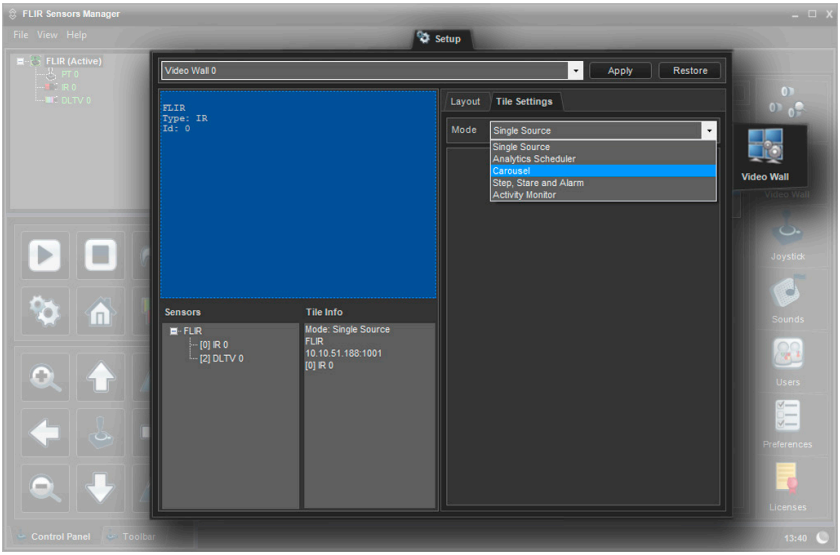


9.2.2.5 Carousel mode

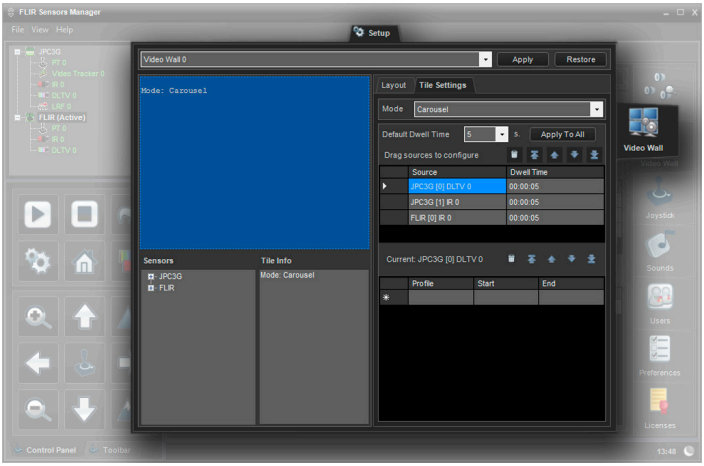
In the Carousel mode, a single tile can swap between different sensors following the specified Dwell Time as well as loading specific profiles for the camera based on the desired schedule.

To set up a tile on this mode, it will be needed to have at least two cameras on FSM.

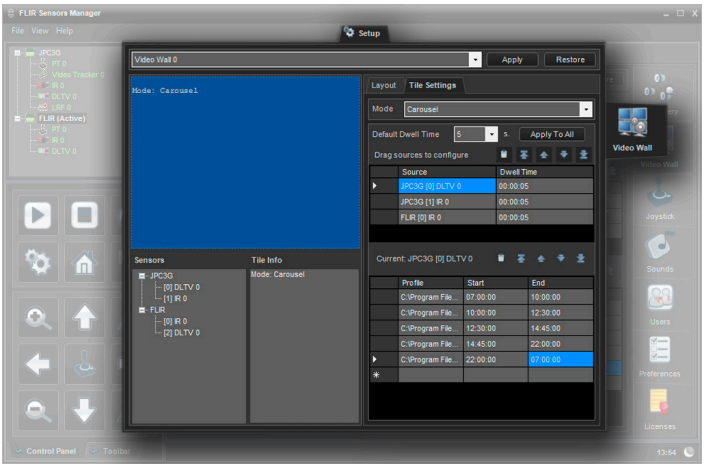
1 To set up a new Carousel tile, select this mode from the drop down list and two new tables will be shown underneath.



2 Drag and drop as many video sources as needed on the first table. FLIR F-Series DLTV, JPC3G IR and JPC3G DLTV have been added in the following image.



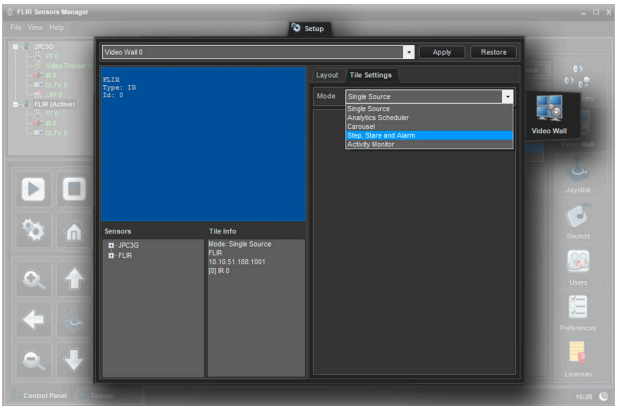
3 If needed, it is possible to create a profile scheduler for each video source. To do so, simply follow steps 3 and 4 of the Analytics Scheduler section for each source. The following image shows an example of a Carousel mode already configured. Finally click the Apply button.



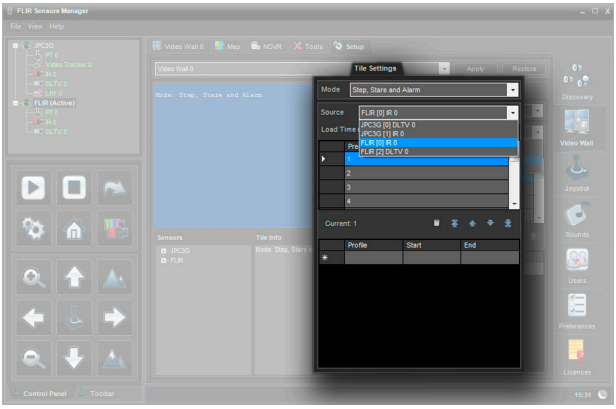
9.2.2.6 Step, Stare and Alarm mode

The Step, Stare and Alarm mode makes use of a single video source working on Scan List mode. When the camera moves to a fixed step of the Scan List, this mode loads a specified video profile. This video profile will be unloaded while the camera moves to the next step and loads a new profile for the next position. To work on Step, Stare and Alarm mode, please make sure there is a sensor with a Pan & Tilt and a Scan List loaded on the sensor.

1 To set up a new Step, Stare and Alarm tile, select this mode from the drop down list and two new tables will be shown underneath.

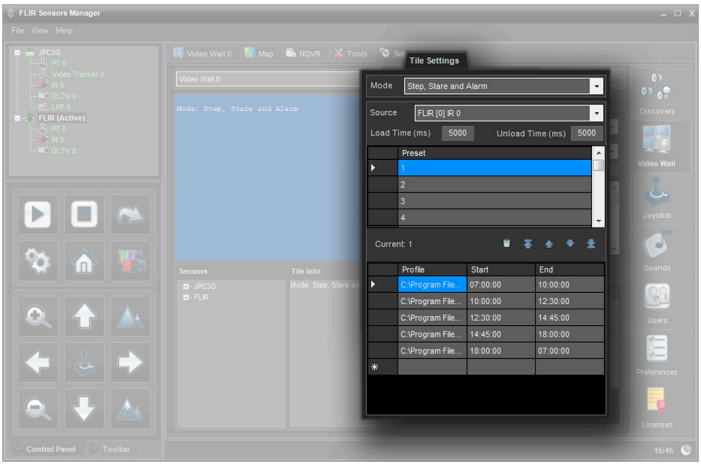


2 Drag and drop a Source or select it from the Source list.



3 Select a row on the Presets List and double click on the cell under the Profile label. A new window will open asking for a video profile to load.

Note: Every row in the Presets List is associated to a single preset. Please make sure the right preset has been selected before creating the following schedule.



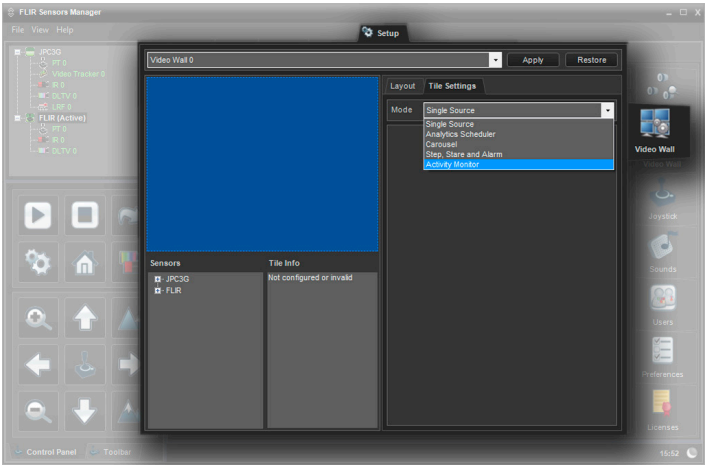
4 Once the video profile is selected, it is possible to choose a Start and End time for this specific profile by simply typing the time in the cells. Repeat steps 5 and 6 as many times as needed in order to create the profiles sequence for the running Scan List. Finally, click the Apply button.

9.2.2.7 ***Activity Monitor mode***

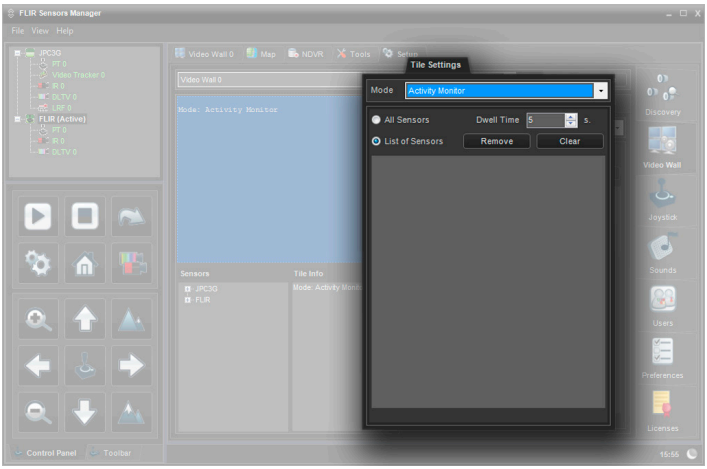
The Activity Monitor mode is very useful to have an instant visualization of an Alarm manager or local analytics event generated by one of the sensors in the network. To work in this mode, two sensors added to FSM are highly recommended, but it is possible to set it up with just one.

There are two ways to set up the Activity Monitor:
- **All Sensors**: Shows the video of any of the sensors in the network that reacted to the alarm or generated the local analytics alarm.
- **List of Sensors**: Only a list of selected sensors will be shown in the tile when their alarms are generated.

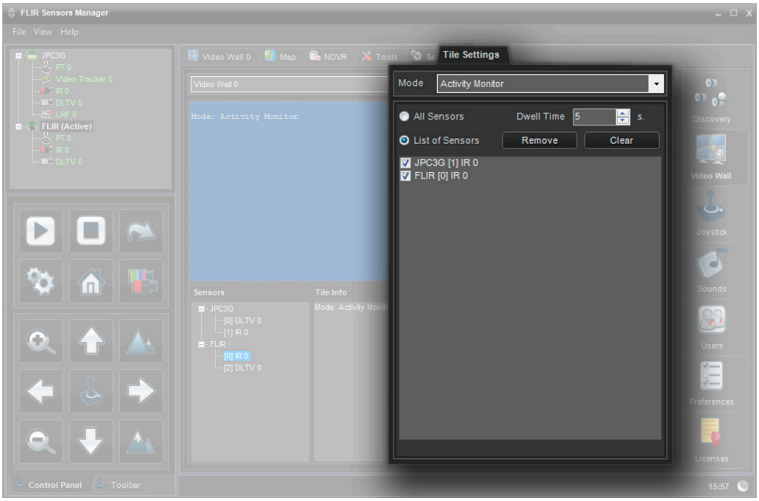
1 To set up a new Activity Monitor tile, select this mode from the drop down list a new section will be shown underneath.



2 Select the All Sensors option if all sensors are going to be monitored on the same tile. On this mode, every sensor that reacted to the alarm or generated the local analytics alarm will be shown on the specified tile for the time selected on the Dwell Time field.



3 Select the List of Sensors option if only some sensors are going to be monitored on the tile. In this case, simply drag and drop the some sensors from the Sensors list.



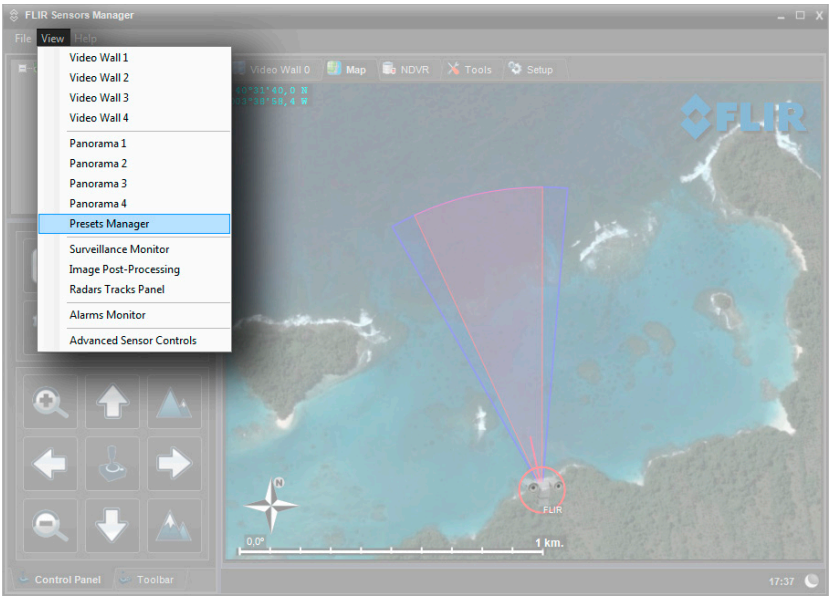
9.3 Video Wall Keyboard shortcuts

In order to facilitate the usability, there are some useful keyboard shortcuts shown below.

Action	Shortcut
Enter Full Screen mode	Ctrl + F Double Click
Exit Full Screen mode	Esc
Arrow cursor mode (no action)	A
Hand cursor mode	H
Reticule cursor mode	R
Zoom in/out cursor mode	Z/(Shift) + Click

10 Presets / Scan Lists Management

Many cameras have the ability to physically move and point to specific positions either automatically or manually. Those positions are called Presets. When the system contains more than one remarkable position (Preset), they can be stored in a Presets List located in the remote sensor or in the local FSM computer and may be used for advanced functions such as the Step Stare and Alarm tile mode described in section 9.2.2. These operations can be done from the Presets Manager.

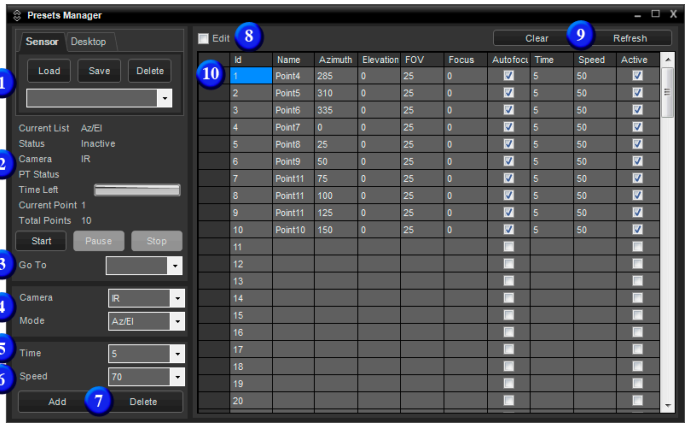


10.1 Presets Manager Overview

The Presets Manager is the tool that allows the user to create, edit and delete presets and preset lists.

The Presets Manager only communicates with the active sensor. When a sensor is set as active, the Presets Manager will display that sensor's current scan list:

To open the Presets Manager, click View → Presets Manager



#	Section	Description
1	Load and Save Options	Load and Save Presets Lists from/to the remote sensor (Sensor tab) as well as from/to the local FSM computer (Desktop tab).
2	General Information	Information about the current presets list and the status of the camera. The selected Preset List scan can be started from this section.
3	Go to	Makes the camera point to the selected Preset.
4	Device Selector	Selects the camera to be used for the current preset. It also allows using different pointing modes: Az/El, the mode by default which uses Azimuth and Elevation information from the camera and Geo modes based on different Global Positioning systems such as LLH (Latitude, Longitude Height) and UTM (Universal Transverse Mercator)
5	Time	Represents how long the camera will stay at its current position, in seconds, until the camera begins moving to the next preset. The Time counter starts once the Pan and Tilt reaches the desired location but does not take into account the time it takes to zoom and focus the cameras.
6	Speed	Sets the velocity, denoted in degrees per second, the Pan and Tilt will move to reach the next preset in the list. This is restricted by the speed limits of the Pan and Tilt unit.

#	Section	Description
7	Add and Delete	Once the camera is in the right position, the current parameters can be saved as a new Preset or even deleted if a preset was selected in advance.
8	Edit	This option must be checked while editing the presets list. Once this option gets unchecked, the list will be saved in its original path, either locally or remotely.
9	Clear and Refresh	Makes the camera point to the selected Preset.
10	Presets List	This table contains all the information from each preset.

Some basic features of the Presets Manager can also be accessed from the Control Panel and the Toolbar. Please refer to section 8 for more information about this.

10.2 Working with Presets

This section will explain how to Add new presets to the current list, Edit specific fields of a preset and Remove a preset from the list.

10.2.1 Adding a new Preset

1 Make sure the current active sensor is the one to be used and control has been obtained.
2 Move the Pan and Tilt to make the camera point to a desired area. The Reticle cursor is very useful in this case.
3 Set the right zoom.
4 Open the Presets Manager. View → Presets Manager.
5 Make sure the Edit option is not checked.
6 Select the camera in use and the pointing system.
7 Set the right Time that the camera will stare at the current position as well as the Speed used to reach it.
8 Click the Add button on the lower left corner. The new preset will be created and the presets list will automatically be saved in its original location.

10.2.2 Editing a Preset

1 Make sure the current active sensor is the one to be used and control has been obtained.
2 Open the Presets Manager. View → Presets Manager.
3 Check the Edit option and let the scan list reload.

4 Double click in the field to be edited.
5 Type the new parameter.
6 Uncheck the Edit option. The new preset will be saved and the presets list will automatically be saved in its original location.

10.2.3 Removing a Preset

1 Make sure the current active sensor is the one to be used and control has been obtained.
2 Open the Presets Manager. View → Presets Manager.
3 Select the row of the preset to be deleted.
4 Click the Delete button
5 Double click in the field to be edited.
6 The preset will be deleted and the presets list will automatically be saved in its original location.

The Clear button is used to delete all the presets from the current list.

10.3 Presets List locations

Preset lists can be located either in the remote sensor or in the local FSM computer. Remote preset lists allow any Nexus Client to access, edit and work with the Presets List at while the camera is under its control.
Local Preset Lists are useful when a user has several Lists that should be changed frequently.

11 NDVR Management

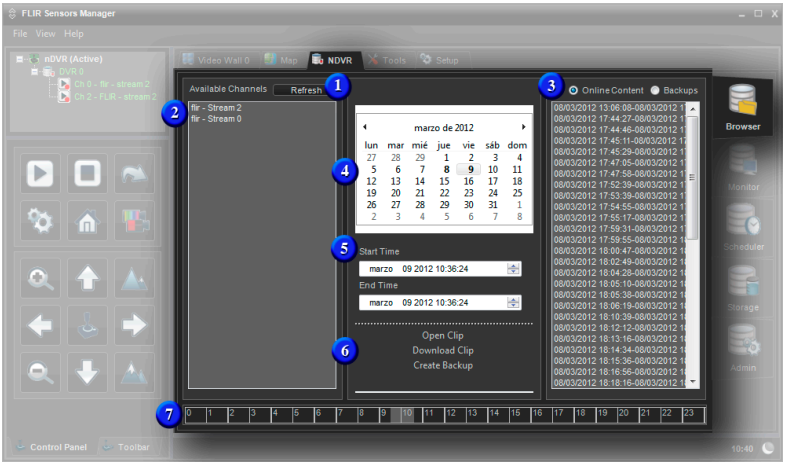
FSM is able to manage video recordings from Nexus compatible NDVRs. Users can get control of the device, see the available channels, download recorded clips, play previous videos and even apply analytics to recorded videos.

The nDVR management is done via the nDVR panel to display the nDVR management panel simply click the NDVR tab.

Tab	Description
Browser	Displays all the available channels as well as its recordings
Monitor	Allows the user to start or stop the recordings as well as delete any available channel
Scheduler	Any recording channel configured as Scheduled Recording type makes use of the shown agenda to start/stop recording
Storage	Shows the hard disks information and allows to manage its contents
Admin	All the available configuration parameters are shown in this tab.

11.1 Browser Tab

The Browser tab displays all the available channels and allows the user to play, download and create backup clips by selecting the specified time.



#	Parameter	Description
1	Refresh Button	The displayed sensor data can be updated by clicking on the Refresh button.
2	Channels List	All the cameras with available recordings on the nDVR are shown on this list.
3	Online/ Backup content	Selects the content to be displayed on the content list.
4	Calendar	Chart where to select the recordings from one day. Those recordings will be shown on the hours tool.
5	Start and End Time	Selects the time where the clip starts and stop.
6	Clip tools	Menu with the options to open, download or create a backup of a clip.
7	Hours tool	This bar allows the user to select the length of the clip that is going to be opened or downloaded.

11.1.1 Online and Backup clips

There are two different content clip types in the nDVR: Online and Backup

- **Online content**: This content gets erased on a FIFO basis. The oldest clips will be deleted in order to leave some room for the new recordings.
- **Backup content**: The Backup content never gets deleted unless the user decides to do so. This is a space limited content that may be configured in the web configuration tool of the nDVR. Creating a backup is as easy as selecting the content and clicking the Create Backup button.

To switch between Online and Backup content, an operator just has to select the appropriate option from the Online/Backup content section and the content list will be updated with the current files.

11.1.2 Opening Clips

Once the user has control on the nDVR, FSM can request the device to start streaming a certain clip and play it on a specified video tile. Please follow these instructions to open a clip from the nDVR:

1 Make sure the nDVR is the active device and under control.
2 If the channels list has not been automatically refreshed, click the Refresh button.
3 Select the channel from the available channels list on the left panel and the content list will be updated with the list of clips.
4 Select the date using the calendar, the time bar and/or the date/time picker controls.
5 Click the Open Clip option and select the video tile where the video will be opened.

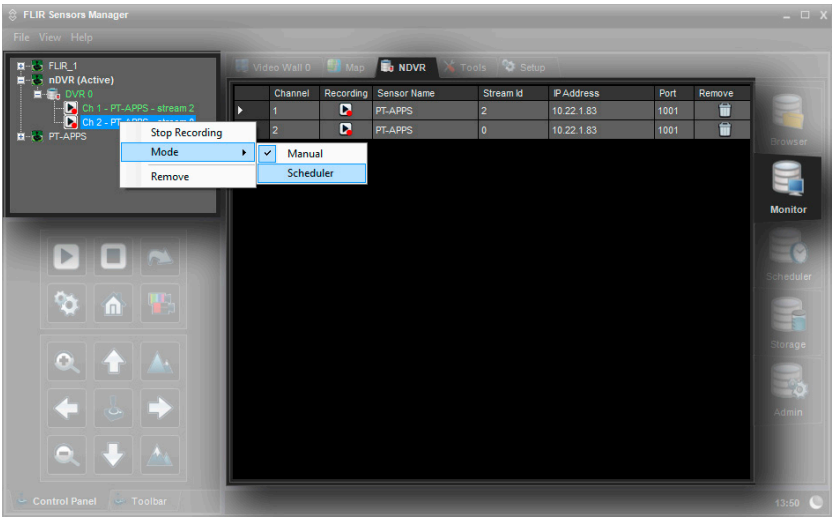
11.1.3 Downloading Clips

Sometimes it might be required to have some clips available offline so the user can play them in a regular video application or send them via email. FSM allows operators with the right permissions to do this simply following these instructions:

1 Make sure the nDVR is the active device and under control.
2 If the channels list has not been automatically refreshed, click the Refresh button.
3 Select the channel from the available channels list on the left panel and the content list will be updated with the list of clips.
4 Select the date using the calendar, the time bar and/or the date/time picker controls.
5 Click the Download Clip option and wait until the download process is finished. Please take into account that these files might be very big so it is not recommended to download more than 10 minutes of video at once.

11.2 Monitor Tab

The Monitor Tab allows operators to manage everything regarding the configuration of the NDVR channels. There are two different NDVR channel types: Manual and Scheduler recording. A Manual recording channel keeps recording as long as the Nexus Sensor is running. On the other hand, an NDVR channel configured as Scheduler recording allows the user to use the scheduler panel on the FSM to set the recoding times. The following steps explain how to set up these channels:



1 Go to NDVR tab → Monitor.
2 Select a camera from any other sensor from the active panel. Drag and drop it on the Monitor tab and the information of the selected camera will be displayed on the panel.
3 By default, all NDVR channels are configured as Manual mode. If the user wants to change it to Scheduler mode, right-click on the channel and select Mode → Schedule.

The Monitor tab allows the user to stop and start the recording by right click on the “Recording” column camera cell and erase the channel from the NDVR on the “Remove” column.

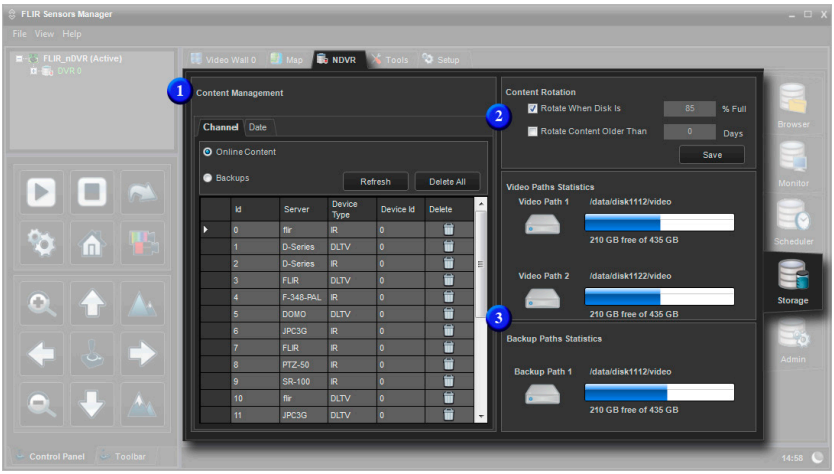
11.3 Scheduler Tab

The Scheduler tab displays an agenda where the user can configure the recording schedule of any channel configured to be on Scheduler mode. A specific schedule can be defined in FSM using its graphic scheduler tool as described in the steps below:

1 Go to NDVR tab → Scheduler.
2 Select the appropriate channel from the Available Channels list. Make sure the channel is set to Scheduler mode.
3 Hold the left button of the mouse to drag and draw the area over the expected recording time. The FSM will now display the recording hours on light grey.
4 The recording time lapses (grey areas) can be edited in two ways:
a. Select the area to be edited and use the panel on the right to change the recording schedule and area name. Click on the Save button for the changes to take effect.
b. Select the area and position the mouse over the edges to change the area size.

11.4 Storage Tab

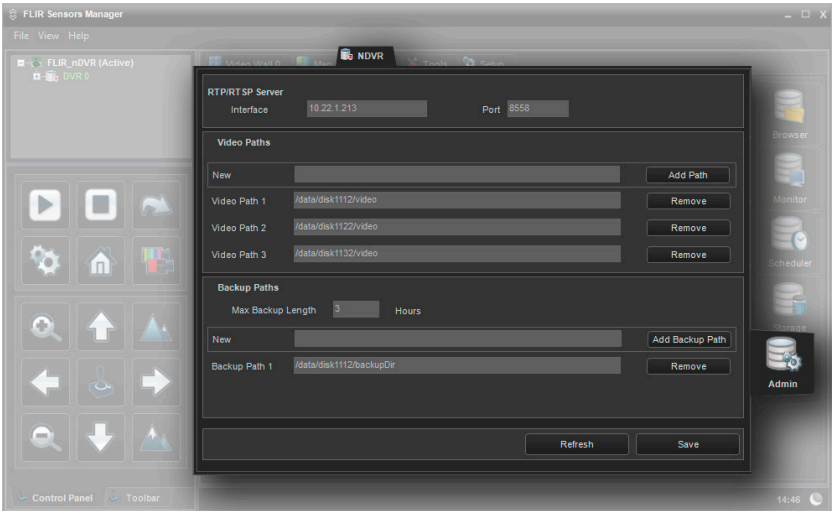
The Storage tab contains all the required controls to manage the hard disks, delete specific content and selecting the rotation rules.



#	Parameter	Description
1	Content Management	This panel allows the user to delete full channel contents or specific recordings based on the dates.
2	Content Rotation	The NDVR is programmed to overwrite old files based on one of the two rules shown in this panel.
3	Video and Backup paths statistics	Each hard drive space is represented on the graphs.

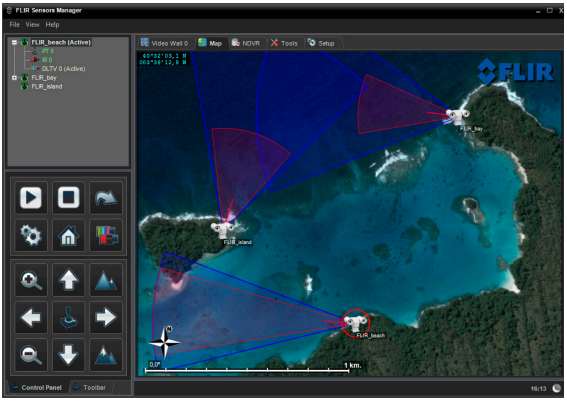
11.5 Admin Tab

The Admin tab shows the configurable fields of an NDVR. Here, an experienced administrator will be able to set up the RTP/RTSP interface as well as the paths where the clips will be saved.



12 FSM Map

FSM allows a user to display every sensor on its real locations on the map. To display the map, click on the Map tab on the main panel. Please make sure the right license has been loaded into FSM before start using the Map (see section 4.3 for more details).



12.1 Basic Controls

An operator will be interested not only in watching the sensors on the map, but also interacting with them, to do so there is a set of useful tools that can be accessed from the Control Panel as well as from some keyboard shortcuts.

Here are the typical Map actions:

Action	Description	Shortcut
Left Click	Shows the contextual menu	None
Reticle Cursor	Allows a pan tilt camera to point towards the location clicked on in the map.	R
Hand Cursor	Allows moving the map around	H
Zoom In	Zooms in the map view	Mouse wheel
Zoom Out	Zooms out the map view	Mouse wheel
Zoom Box	Zooms to the specified Area	None
Edit Area	Allows the user to draw alarm, detection, and exclusion areas when the active sensor is a radar sensor	None
Ruler	Displays the distance between the selected points or objects.	Left Click Shift + Left Click

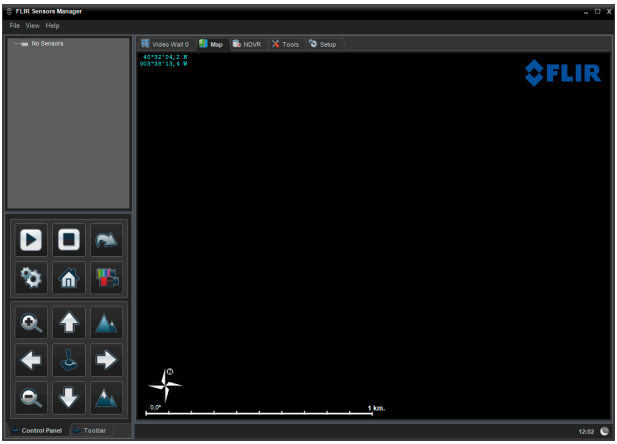
12.2 Loading a Map

A Map is just a BMP or JPG image showing a certain area where all the sensors are located and referenced to each other with respect the map. There are two ways to load Maps:

- Manual: The user selects the map to be used.
- Automatic: Once the maps have been calibrated FSM loads the most appropriate map based on the coordinates and zoom.

12.2.1 Manual Load

A manual load is always needed to start using this feature. Loading a map manually allows the user to set the right image and calibrate it with the right coordinates. When no map has been loaded into FSM, the map module will appear black:

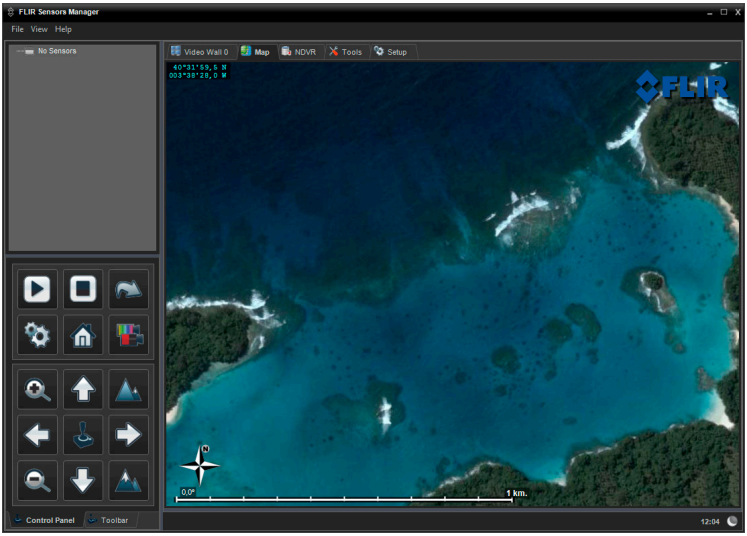


The image above shows a black background which is the default one when no Map has been previously loaded. It also shows the coordinates of the cursor when moving it over the map. These coordinates are just the default ones, so once the map is calibrated it will show the right ones for the loaded map.

Follow these steps to load a Map:

1 Make sure the right license is loaded (see section 4.3 for more details).
2 Copy the map image in the Media Folder (usually C:\Program Files\FLIR Sensors Manager 2012\map). Make sure it is either a North-Up, orthonormal BMP or JPG file.

3 Right-click on the map surface.
4 Go to Map Options → Load Background and select the map image copied before.



The map is not calibrated yet, so it will be required to calibrate it before placing sensors on it. To do so, please follow the steps from section 12.3.

12.2.2 Automatic Load

Once one or more maps have been calibrated the user can let FSM choose which map file is the most appropriate for each situation. This is especially useful when having big maps and zooming in certain areas is required. In this situation several maps with different zooms have been calibrated and FSM will choose the most appropriate one.

Follow these steps to use this feature:

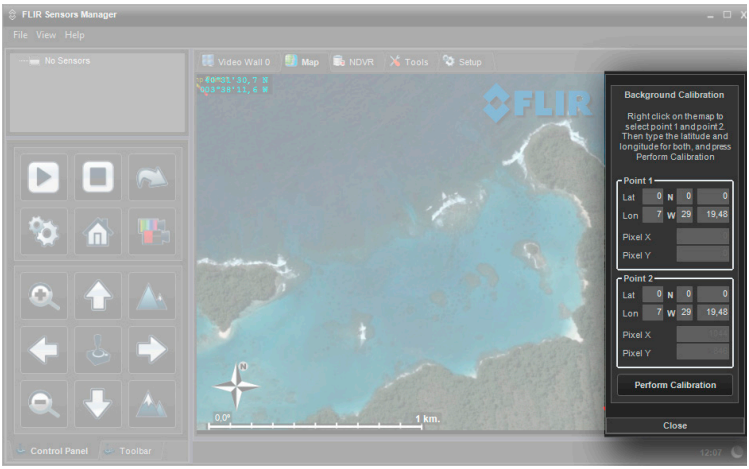
1 Make sure all the required maps have been calibrated following the steps from section 12.3.
2 Right-click on the map surface.
3 Go to Map Options → Load Background and select the Auto option.

12.3 Calibrating a Map

The map calibration establishes a relation between pixels on the map and the corresponding geographical points on the earth. This allows managing the geographical functionalities of each sensor using the features in the map controls.

Follow these steps to calibrate a map:

1 Make sure the Map has been manually loaded following section 12.2.1.
2 Right-click on the map surface.
3 Go to Map Options → Map Background Calibration.
4 The Background Calibration panel will pop-up.



5 Select two separate points on the map and get the right coordinates for them. It is a good practice to select point on the upper-left and lower-right corners. This reduces errors on GPS coordinates and pixel conversions.
6 Right-click on the map.
7 Select Get Coordinates for Calibration Point 1. Pixels information is automatically loaded on the panel
8 Type the Latitude and Longitude of the chosen point in the Point 1 section. In case the area is not North and West, clicking the N and W letters will switch to the opposite values.
9 Right-click on the map again
10 Select Get Coordinates for Calibration Point 2.
11 Type the Latitude and Longitude of Point 2.
12 Click Perform Calibration and the information shown above on the map will be the right one for the selected area.

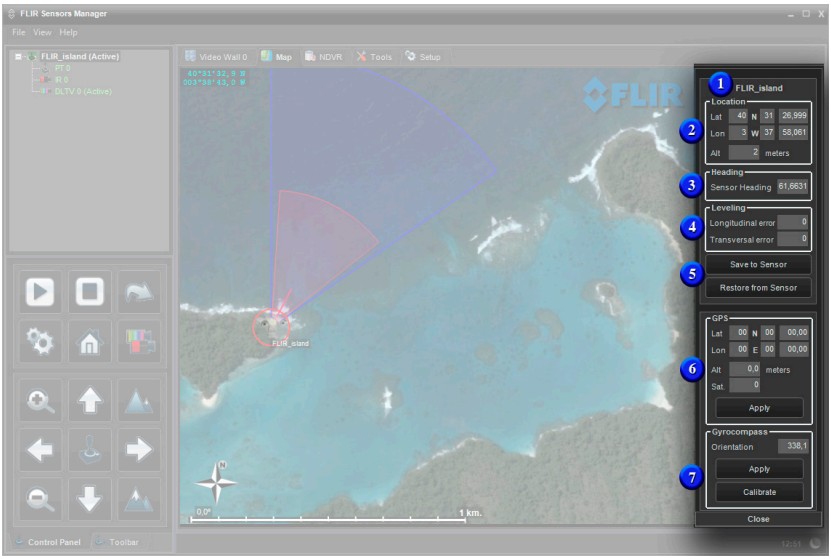
Calibrating a map should not change the shape of the image. If the image is stretched in any direction, the calibration was not well done. Please make sure the Latitude and Longitude parameters are the right ones for the chosen points.

12.4 Georeferencing a Sensor

Georeferencing a Sensor means placing it on its exact position on the map one it has been already calibrated. This will allow the user to have a good view of all the sensors on the network as well as using all the advanced functionalities related to its position.

These are the steps to be follow in order Georeference a sensor on the map:

1 Take control of the Nexus Sensor and make sure it is the Active one in the list.
2 Right-click on the map
3 Select the Active Sensor → Georeference Sensor option.
4 The Georeference panel is displayed on right side.



#	Section	Description
1	Sensor Name	Displays the name of the sensor that is currently being georeferenced
2	Location	Displays and allows modifying the sensor current location and above-the-ground altitude
3	Heading	Displays and allows modifying the sensor current heading
4	Leveling	Displays and allows modifying the sensors' current leveling
5	Save and Restore	Saves/Restores the current values in/from the sensor
6	GPS	Displays the current GPS information reported by the Sensor. It must have a GPS device configured previously
7	Gyrocompass	Displays the current Gyro information reported by the Sensor. It must have a Gyro device configured previously

1 There are three ways to get the right coordinates of the sensor:

a **Typing them manually**: If the parameters are known, the user can type the right latitude, longitude and altitude in the Location panel and click Save to Sensor to store the new data.

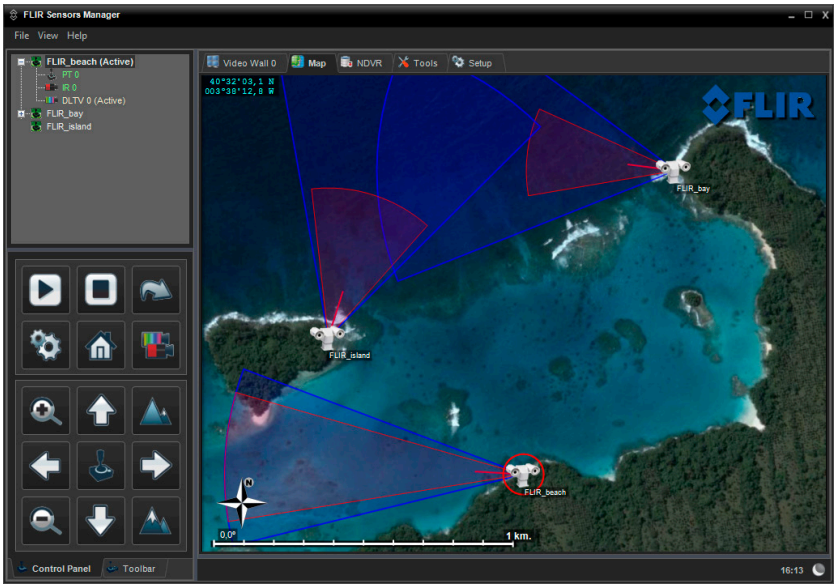
b **Getting them from the calibrated Map**: Once the Map has been calibrated, right-click on the future location of the sensor and select Active Sensor →Get Coordinates for Sensor Georeference. Once the sensor has moved to the right location, click Save to Sensor.

c **Getting them from the GPS device**: If the sensor has a GPS configured, data will be automatically taken from it so the operator does not have to worry about its real location.

If the sensor cannot be mounted on a horizontal plane, the leveling error can be fixed using the Longitudinal Error field (Y axis fix) and the Transversal Error (X axis fix).

12.5 Waypoints

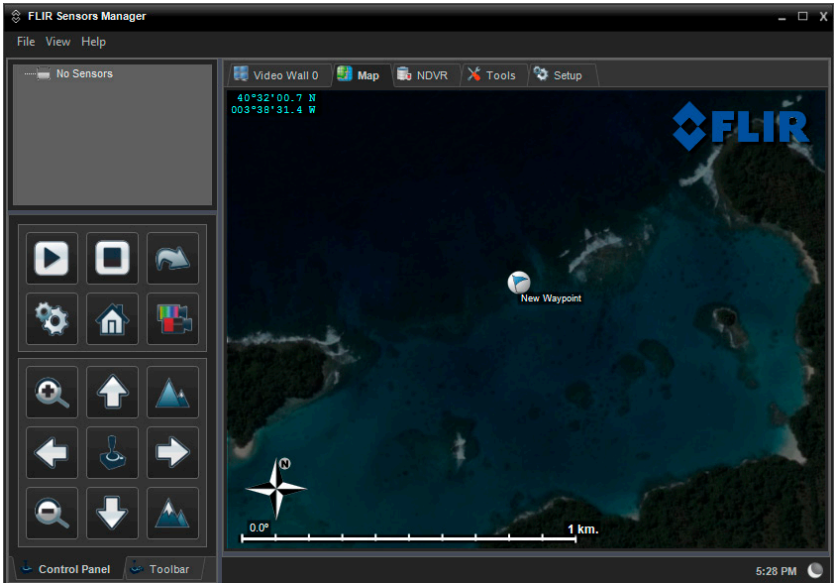
Waypoints are specific spots on the map defined by the operator indicating points of interest. The name, location and icon of each Waypoint can be fully customized while creating them and can indicate any kind of area such as buildings, vegetation, bridges, gates, etc.



Once the user has placed all the Waypoints on the map, the Reticle cursor will be useful to make the camera point to them without spending time on looking for specific spots.

12.5.1 Creating a new Waypoint

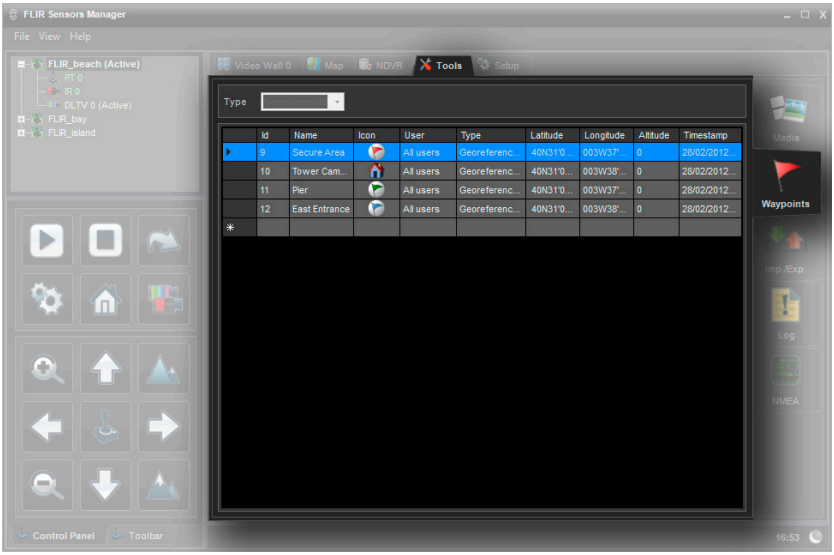
Creating a waypoint is as easy as right-clicking on the map and selecting Add Waypoint. A new icon will be shown on the map containing a blue flag and the default name as shown below.



A Waypoints List can be shown on the map right-clicking on it and selecting View → Waypoints List.

12.5.2 Editing a Waypoint

A waypoint can be customized on the Waypoints section on the Tools tab → Waypoints. The operator will find all the customizable fields in this section and modify them by just double clicking on them.

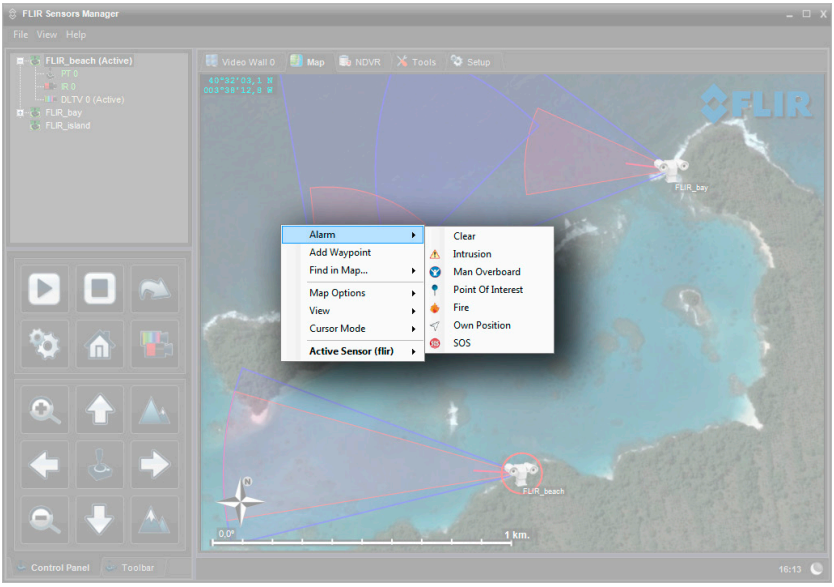


12.5.3 Showing Waypoints on the Panorama

It is also possible to display the current waypoints on a given Panorama so the operator can identify where they are in the actual field. Please read section 16 to learn more about this feature.

12.6 Raising Alarms from the Map

It is possible to manually raise alarms from the map when the operator detects fire, an intrusion or simply want to inform about an event to the rest of FSM computers on the network.
Please refer to chapter 18 for more information about this.

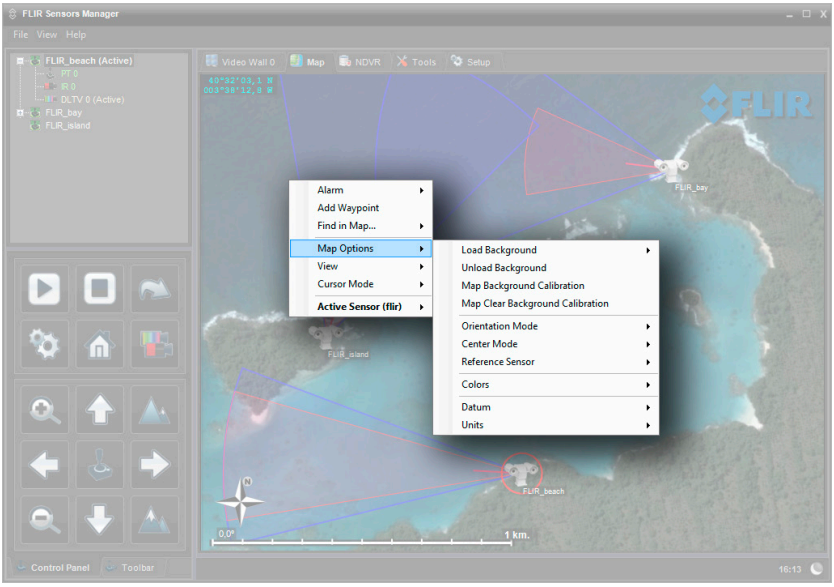


12.7 Find in Map

This option lets the operator find any available sensor in the map. It becomes especially useful when there are several sensors on the network or while using the Auto Map option.

12.8 Map Options

The contextual menu of the Map brings several options related to geo-referencing sensors, orientation, color, etc. Users can see these options by right-clicking on the map and select Map Options



12.8.1 Reference Sensor

Some Orientation and Center modes need to use a sensor as a reference to recalculate the map view. There are two options to select the reference Sensor:

- Active: Uses the active sensor as the base for the map display. The map will adapt every time a new active sensor is selected.
- Specific sensor: One sensor from the list can be chosen so the map will be adapted for this specific sensor even if it is not the active sensor.

12.8.2 Orientation Modes

A Map will be oriented with the north up by default, but it may be required to rotate the map based on a given sensor so it moves when the sensor changes its position or orientation.

The following table describes the three orientation modes.

Mode	Description
Manual	This is the default mode. The orientation of the Map can be changed with the shortcut Alt + Mouse Wheel and will remain unchanged until it is modified manually.
Course Up	Based on the GPS course of the Reference Sensor, the map will rotate in order to keep the course progress up.
Head Up	Rotates the Map so the camera is always pointing upwards. When the camera is aiming a new position, the mp also moves so it keeps the new FOV up.

12.8.3 Center Mode

Having many sensors on the map may require getting one of them centered in the picture or moving the map so the Active Sensor is always in the middle. This can be done by selecting the appropriate Center Mode.

Mode	Description
Manual	The operator can freely move the map centering it at any desired area.
Auto	The map centers itself on the Reference Sensor.

12.8.4 Colors

It is possible to customize the color of each layer such as IR FOV, DLTV FOV, Radar Tracks, etc selecting them from this menu.

12.8.5 Datum

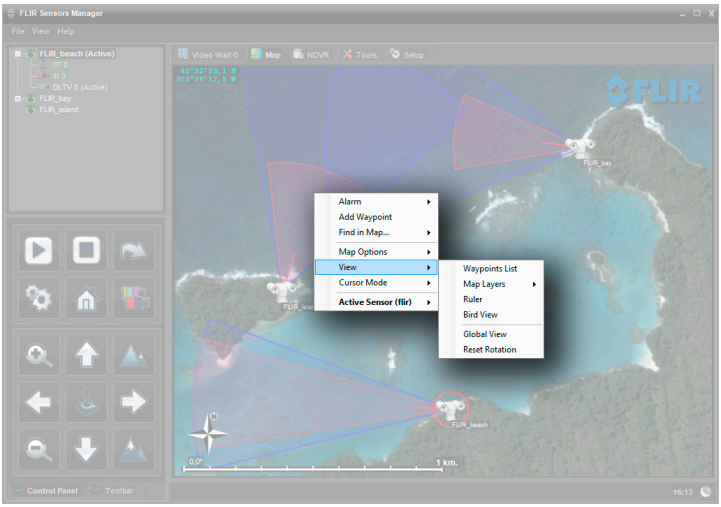
The Datum section allows the operator to choose the most appropriate setting for the loaded map image. WGS-84 is the conversion by default, but there are more than 20 different ellipsoid conversions to choose.

12.8.6 Units

The operator is allowed to choose the most appropriate units for the Map from the three available ones: Metric, Statute, and Nautical.

12.9 View Options

FSM offers several view options such as adding layers, showing a ruler or even displaying a bird view. All These options are found in the view section.



12.9.1 Waypoints List

Working with Waypoints is very useful as described in section12.5, so in case the operator needs to have a list of all the available Waypoints, a new panel will be opened over the map with this option.

12.9.2 Layers

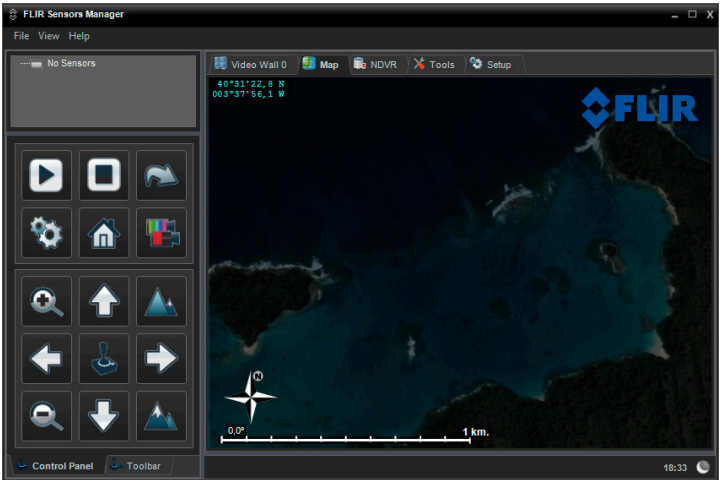
In case the operator is not interested in showing the FOVs, Radar Tracks, Waypoints, etc, those layers can be disabled selecting the appropriate combination on this section.

12.9.3 Bird and Global View

The Bird View offers a general, north-up view of the current map as a small tile on the top-left corner of the image. It also shows a red rectangle defining the current visible map with the right rotation.
This Bird View is not affected by the Background Opacity

12.9.4 Map Background Opacity

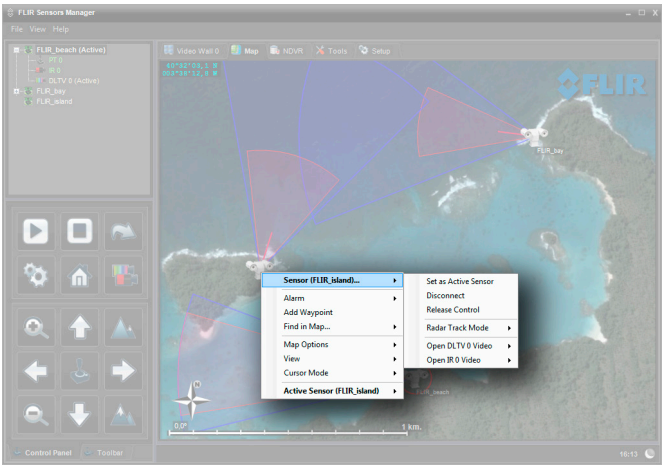
When the user needs to bring out the sensors, tracks areas or any other layer rather than the map itself, FSM allows darkening the map with this option or pressing B/Shift + B.



Note: Remember, Shift + B decreases the opacity.

12.10 Sensor Options

When a Sensor has been added and is located in the map, right-clicking on it will bring a new contextual menu with its sensor name as the first option. This section describes all the features accessible from this menu.



12.10.1 Sensor management options

The first section contains all the sensor managing features.

Option	Description
Set as Active Sensor	Makes it the active sensor. This does not imply to get control over the chosen sensor.
Connect/Disconnect	Connects or disconnects the current sensor.
Request/Release Control	Requests or releases the control of the current sensor.

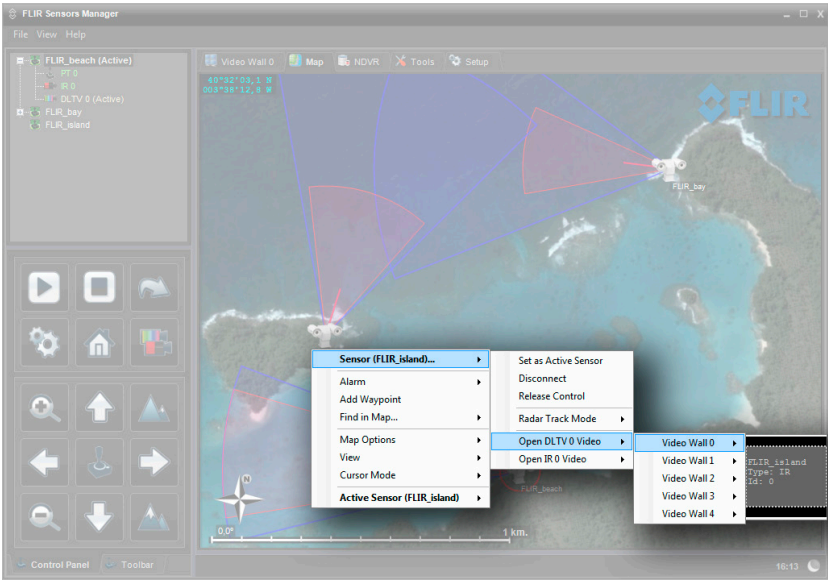
12.10.2 Radar Track Modes

This option brings all the radar track modes.

Mode	Description
Manual	Lets the operator choose what track to engage manually.
Track Engage Last	Engages the last track detected.
Track Scan	Engages all the current tracks one by one.

12.10.3 Video options

It is possible to open video streams directly from the map using this option. To do so, simply click the right camera and select the appropriate video tile where the video should be opened.

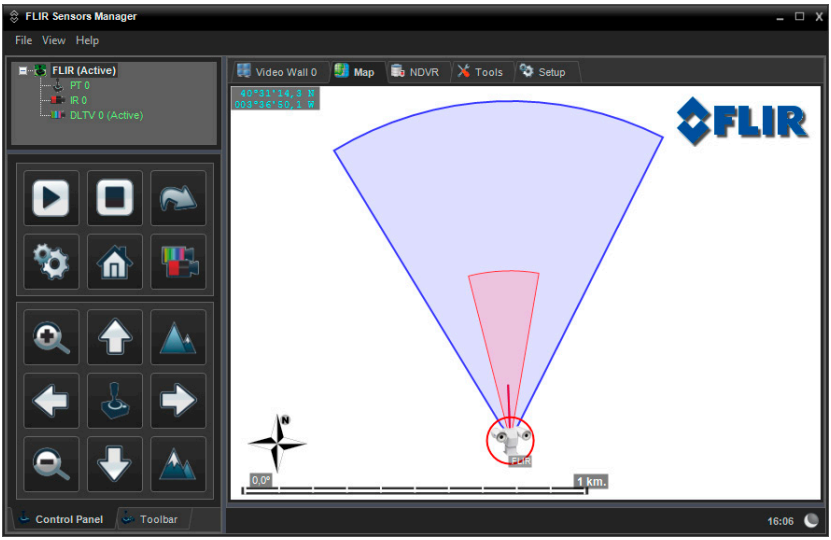


12.11 Sensors on the Map

The sensors that can be displayed on the map usually have an associated set of graphics, (depending on the sensor type) that will display the sensor status data. This section contains descriptions of the main parts of each sensor on the map.

12.11.1 Cameras

If the sensor has any cameras associated with it, a camera's expected viewing area is shown by red and blue cones on the map. The expected viewing area is determined by the camera's FOV, height, and angle of tilt.



Name	Default Color	Description
IR FOV	Red	The red cone is the IR cameras viewing area calculated by the IR's Field Of View (FOV), height of sensor and angle of tilt on the pan tilt.
DLT FOV	Blue	The blue cone is the DLTV cameras viewing area calculated by the DLTV's field of view (FOV), height of sensor and angle of tilt on the pan tilt.

12.11.2 Radars

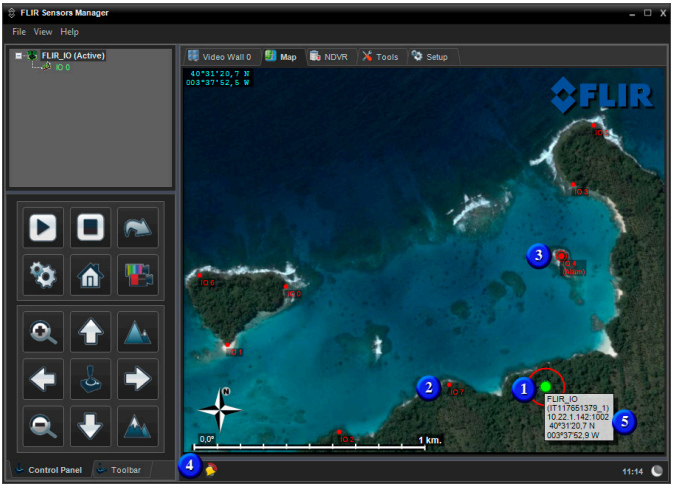
The radar-type sensor status data is displayed on the map surface as shown below:

#	Name	Default Color	Description
1	Scan Sector	Red	The radar scan sector is displayed in green on the map surface.
2	Tracks	Yellow	Each radar track is displayed on the map surface including its identifier, as a text label beside it, and a brief trail to show its history.
3	Radar Track Summary	Text Box	The radar track summary is displayed when the mouse is placed over it.

For more information about Radars and FSM, please read section 13.

12.11.3 I/O Sensors

The I/O-type sensors are displayed on the map surface, including both the I/O box location and the sensors location:



#	Name	Default Color	Description
1	I/O box icon	Green dot	The sensor icon displayed on the map shows the I/O box location.
2	Sensors	Red	The I/O sensors are displayed on the map as dots with an identifier label.
3	Sensor in Alarm Status	Red ring	When an input sensor is in alarm state, it is shown on the map surrounded by a ring, the word Alarm can be read on its label (IO4 on this map).
4	Alarm	Bell icon	When an input sensor is in alarm state, a notification will pop up and a bell icon will be displayed on the bottom bar of the FSM. The bell icon will stay until the user acknowledges the alarm by clicking on the icon.
5	Sensor Summary	Text Box	The sensor status data summary is displayed when the mouse is placed over it.

12.11.4 Ground Sensors

The ground-type sensors are displayed on the map surface, including both the base station location and the sensor's location:

#	Name	Default Color	Description
1	Base Station Receiver icon	Icon	The sensor icon displayed on the map shows the base station location.
2	Sensors	Red	The Ground sensors are displayed on the map as dots, a graphic depicting its range, if available, and an identifier label.
3	Sensor in Alarm Status	Blinking Red	When a ground sensor is in alarm state, it is shown on the map surrounded by a ring and the word Alarm can be read on its label.
4	Alarm	Bell icon	When a ground sensor is in alarm state, a notification will pop up and a bell icon will be displayed on the bottom bar of the FSM. The bell icon will stay until the user acknowledges the alarm by clicking on the icon.
5	Sensor Summary	Text Box	The sensor status data summary will be displayed when the mouse is placed over it.

12.11.5 Sensor Management

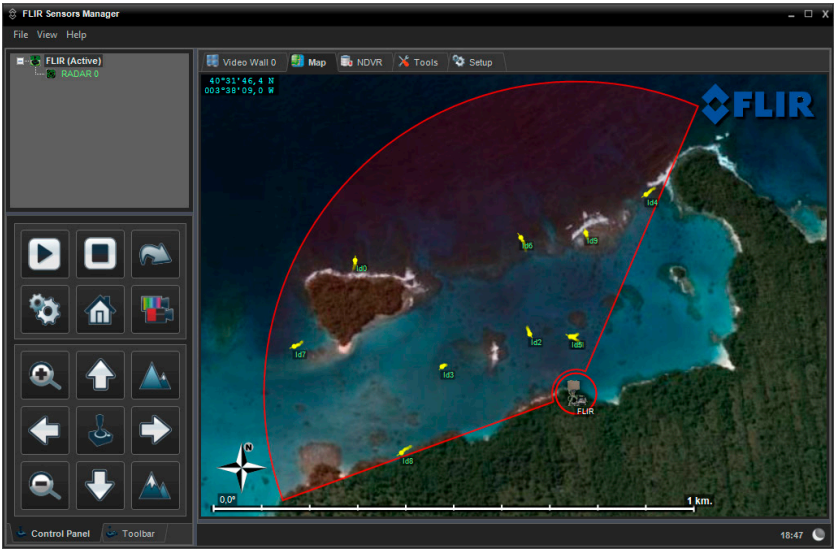
Several sensor management tasks can be performed from the map. Some of these tasks are common to all sensors, others are type dependent, and some may involve multiple sensors of more than one type.

12.12 Map Keyboard Shortcuts

Action	Shortcut
Arrow cursor mode (no action)	A
Hand cursor mode (pan)	H
Reticule cursor mode (aim)	R
Zoom in/out cursor mode	Z/Shift + Z
Zoom in/out	Mouse wheel
Pan horizontally	Ctrl + mouse wheel
Pan vertically	Shift + mouse wheel
Map Rotation right	Alt + Mouse Wheel / Ctrl + R
Map Rotation left	Alt + Mouse Wheel / Ctrl + Shift + R
Reset Rotation	Crtl + N
Map Opacity (increase/decrease)	B /Shift + B

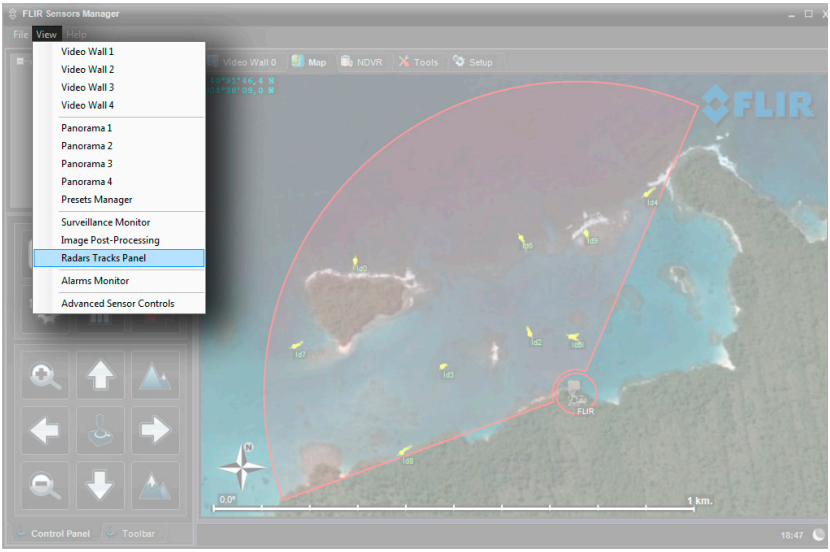
13 Radars

FSM can handle installations with several sensor types including Radars. This kind of sensor has its own set of features and capabilities described in this chapter.



13.1 Radars Tracks Panel

Alarms and tracks detected by the radar are all accessible from the Radar Tracks Panel. This panel is located on View → Radars Tracks Panel.



If the Only Alarms option is checked, only the tracks in alarm status will be listed, otherwise, all events from radars will be shown in the list.

13.1.1 Acknowledging Alarms

To acknowledge an Alarm on this Panel simply double click on it and it will be registered as acknowledged by the current user.

13.1.2 Engaging a P&T to a Track

Right-clicking on any of the available lines brings the option to engage the active sensor to the selected Track ID. To do so FSM must have control of the current sensor.

13.2 Radar Areas

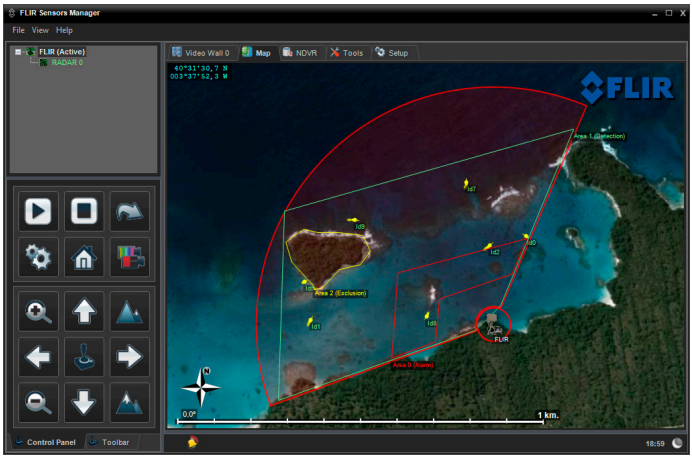
Radar tracks live information is displayed on the map as they are being acquired. They are moving on the map based on its actual GPS position and relative speed to the ground. This brings more surveillance options such as creating alarm areas on the map.

Radar Areas are locked to their geographical position. This means that areas will not move even if the sensor moves around based on its own GPS information, so these areas will always cover the same location.

13.2.1 Differences between Areas

There are three different area types described in the table below.

Area	Color	Description
Alarm	Red	Raises an Alarm when a new track enters in the specified area.
Detection	Green	Defines the area where the radar will detect tracks. When one area of this kind is present, any part of the field not covered by Detection Areas will ignore all the tracks.
Exclusion	Yellow	This area defines blanking zones inside of Detecting areas. Any track passing through this area will be ignored even if it is inside a Detection Area.



13.2.2 Creating an Area

Follow these steps to create any kind of area.

1 Make sure FSM is under control of the Radar Sensor and it is the active sensor.
2 Go to the Map tab and find the Radar.
3 Select the Edit cursor.
4 Click on the map and create the area with the desired shape.
5 Double click on the last vertex and select the appropriate area type.

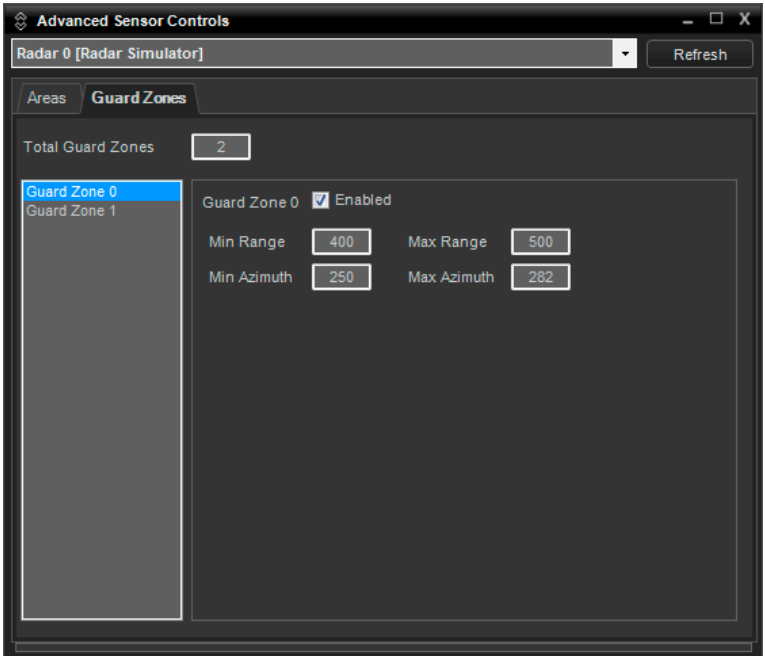
13.2.3 Deleting an Area

Deleting an Area is as simple as right-clicking on the Area name on the map and selecting the Area (Id) → Remove option.

13.3 Radar Guard Zones

Radar Guard Zones are alarm regions around the radar sensor. In this case, the radar sensor might be installed in a boat or any other moving vehicle enabled with a GPS, if so, the radar and its guard zones will move accordingly with its actual location in real time. In the picture below, the guard zones are shown in yellow.

Guard zones are always circular sectors surrounding the radar sensor. It is possible to configure the number of guard zones, their ranges and angles on the Advanced Sensors Panel. Double click on the radar device from the sensors panel to open its Advanced Sensors Control panel and select the Guard Zones tab.



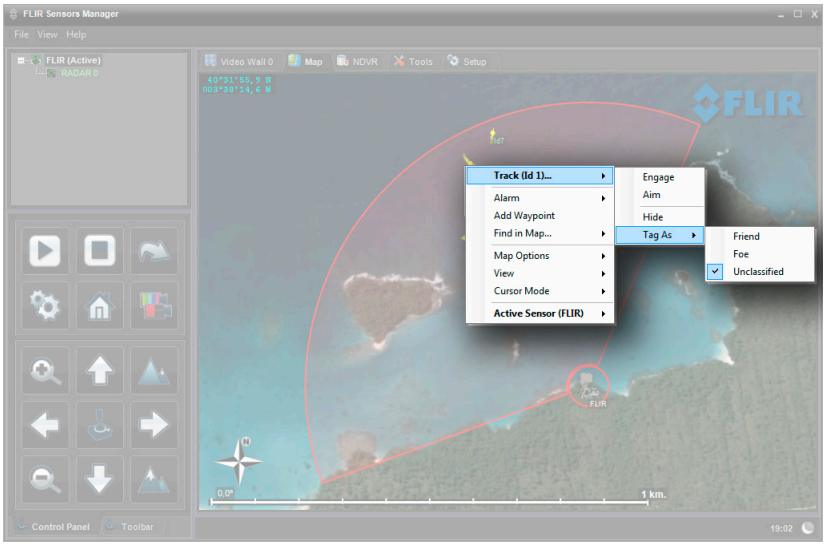
These steps describe the way to add and edit any Guard Zone:

1 Type the total number of guard zones to be created in the Total text box.
2 Select one of the guard zones and type range and azimuth parameters.
3 Make sure to enable the guard zone so tracks are reported on that sector.
4 Repeat steps 2 and 3 with all the guard zones created in step 1.

13.4 Radar Tracks Classification

Once a radar track has been identified by an operator, it is possible to classify it on three different levels: Friend, Foe or Unclassified.

To classify a track, go to the map and right click on the moving track, select the “Tag As” option and choose the appropriate tag.



The following table describes the behavior or each type of track classification.

Tag	Description	Alarm
Friend	A known track that supposes no risk and will not generate any alarm	No
Foe	A known track recognized as a security risk. It will raise alarms	Yes
Unclassified	An unknown track that will be treated as a Foe unless it gets recognized and classified as a Friend by an operator	Yes

14 Playing Video

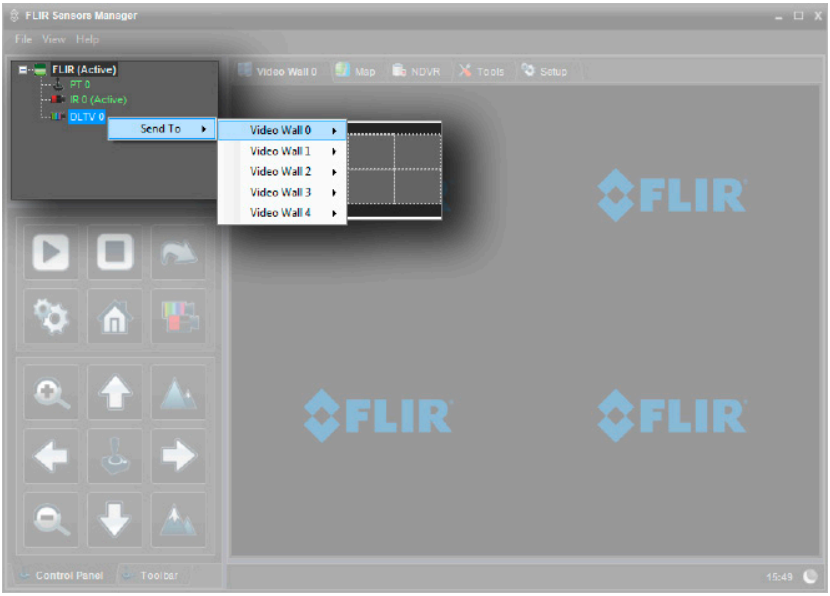
One of the main features of FSM is the video displaying. FSM allows several ways to create Video Walls (section 9) and configure different Surveillance systems (Section 15). Each video tile can be configured with three different video sources: Network streams, video files and video from a frame grabber. This chapter describes how to play each of these video sources into FSM.

14.1 Playing video from a Network Stream

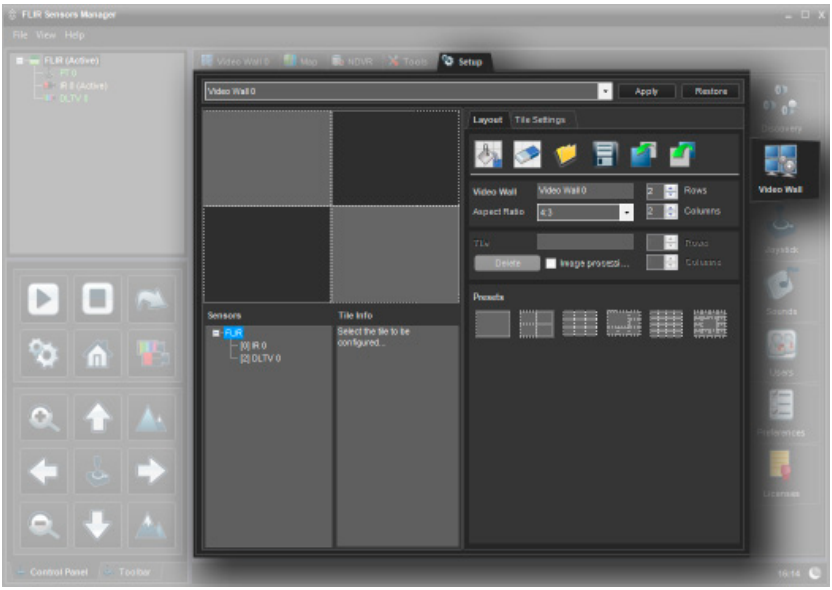
This is the standard use of FSM where some cameras have been connected to the network and their videos are available from any FSM. This section describes the different ways to open a network video stream.

14.1.1 Opening video from the Sensor List panel

Right-clicking on a camera device from the Sensors Panel brings the Send To contextual menu. From here, an operator is able to send the video stream from the selected camera to the right video wall and tile.



Note: Please make sure the video tiles have been initialized while configuring them and therefore they are shown in light gray and not dark gray



14.1.2 Opening video from the Map

It is possible to open video straight from a sensor on the map. Please read section 12.10.3 for more information about this.

14.1.3 Opening video after configuring a Video Wall

While the user is configuring the Video Wall, it is possible to assign the appropriate videos for each tile at the same time. Please read section 9.2 for more information about this.

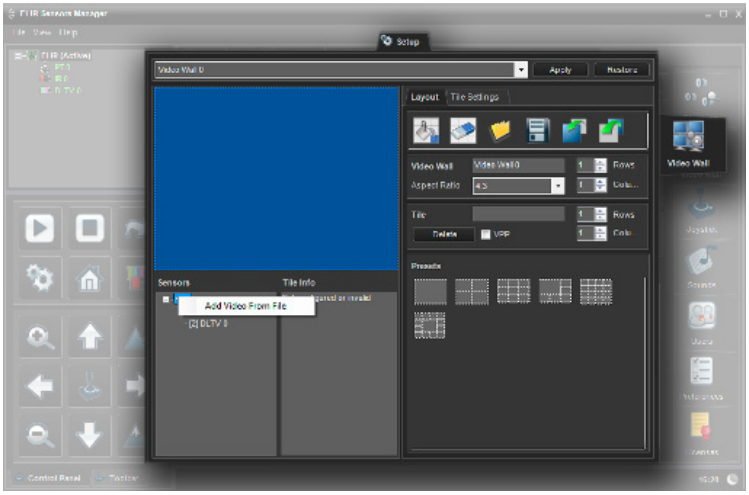
14.2 Playing video from Files

FSM is able to use a video File as the base for all its analytics, display and video wall features. This is highly recommended while configuring a Surveillance system since having recorded videos of the area might be helpful while adjusting the parameters of the Analytics and VMD algorithms.

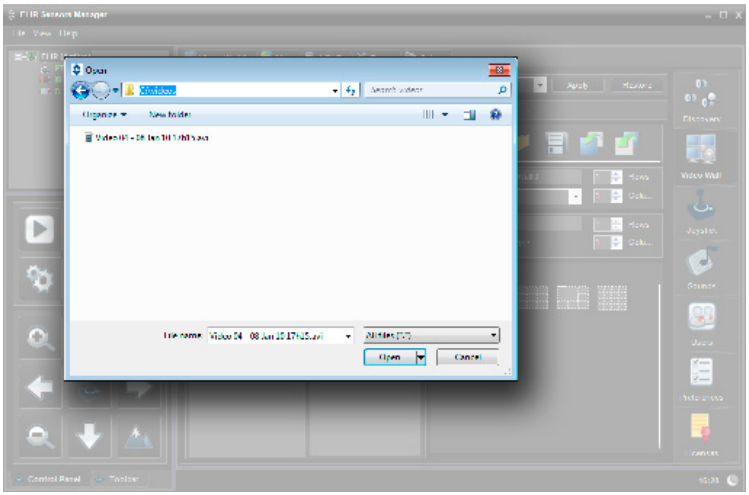
Before a file can be configured to be played in the video wall, it must be assigned as a sensor video source.

Follow these steps to play video from a file on FSM.

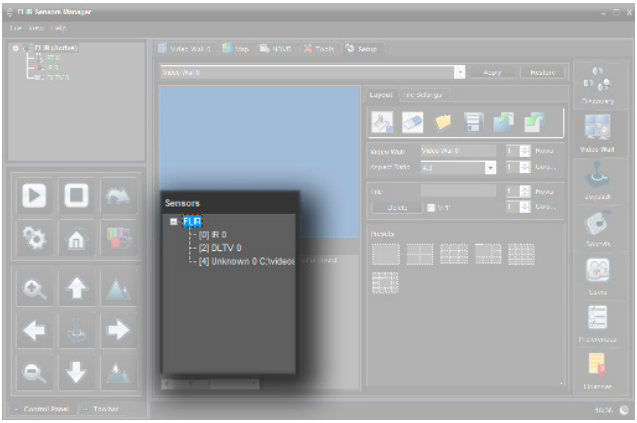
1 Right-clicking on a sensor will show the context menu:



2 When the Add Video From File option is selected, a window prompting for the file to be opened is shown:

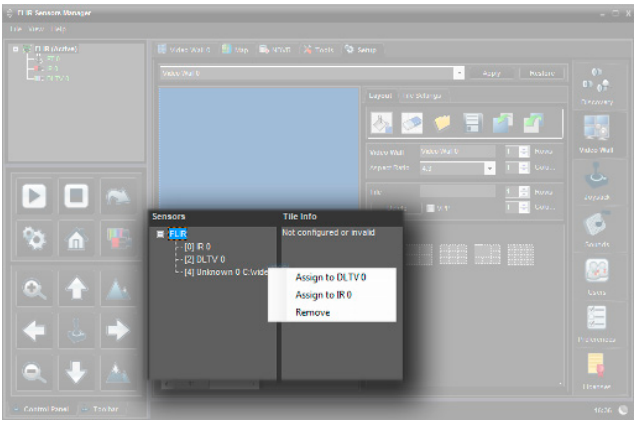


3 When a file is selected, a new video source is added to the sensor:



The video source (file type) can now be configured to be played as any other video source.

4 The video source (file type) can be assigned to a DLTV or IR camera, if any were configured in the sensor, or removed by right-clicking on it:



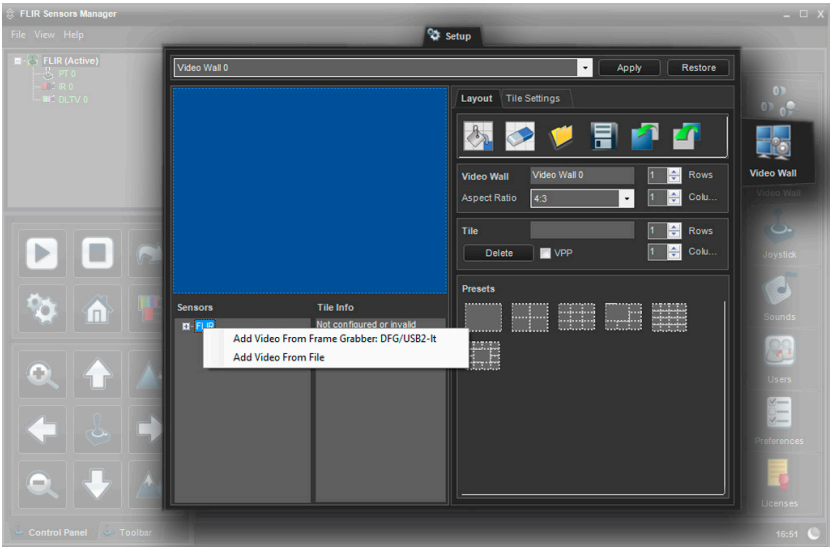
Assigning the video to a device will lead to having the device respond to the commands performed on the video coming from the file.

14.3 Playing Video from a Frame Grabber

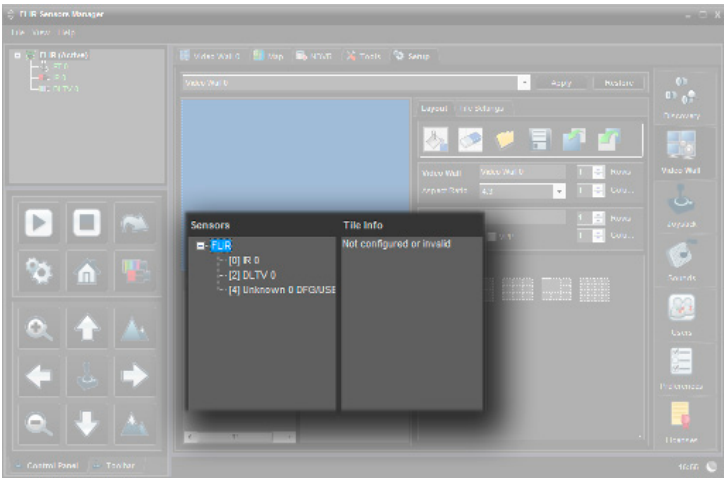
If the video is coming from an analog source, a frame grabber will be required for displaying that video into FSM.

Before a frame grabber can be configured to be played in the video wall, it must be assigned as a sensor video source.
Follow these steps to display a video coming from a frame grabber:

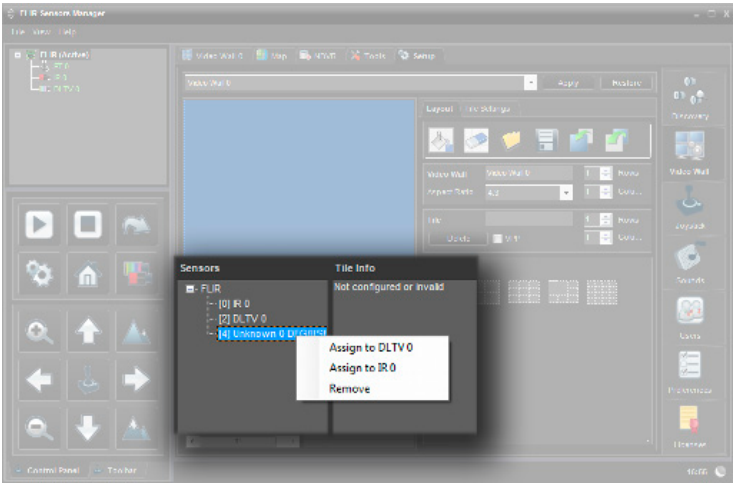
1 Right-click on a sensor will show the context menu:



2 When a frame grabber is selected, a new video source is added to the sensor:



3 The frame grabber video source can now be configured to be played as any other video source. The video source can be assigned to a DLTV or IR camera, if any were configured in the sensor, or removed by right-clicking on it:



Assigning the video to a device will lead to having the device responding to the commands performed on video coming from the frame grabber.

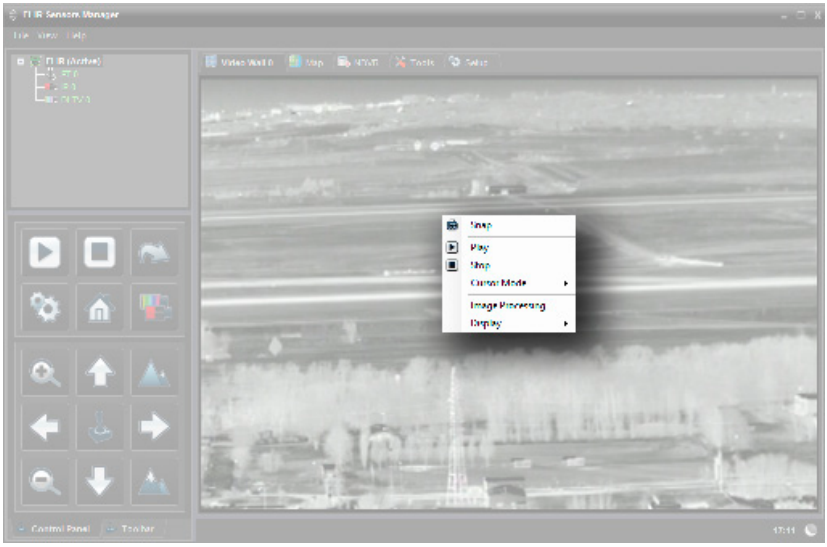
14.4 Video Playback Management

The Video Playback Management options allow the operator to take snaps, pause the video or even move through the timeline of a recorded or a file video.

The video playback commands are available on both the context menu and the Video Toolbar. The context menu can be shown by right-clicking on a video player.

14.4.1 Video Playback options contextual menu

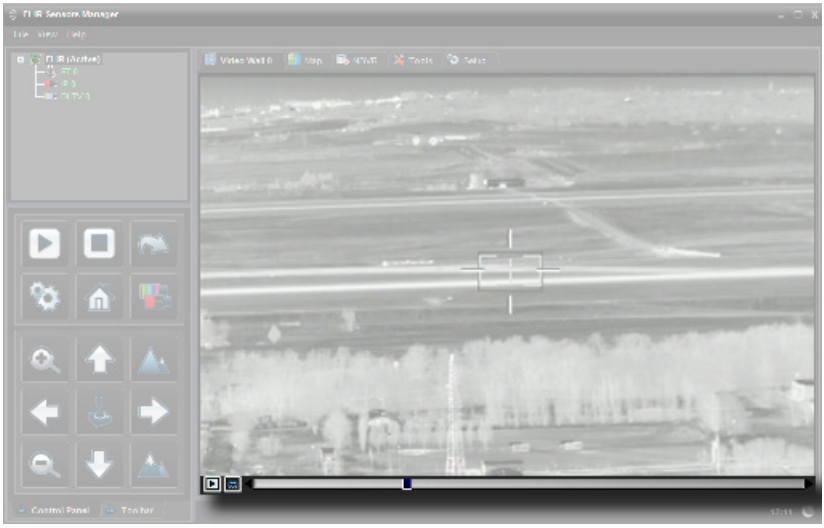
Right-clicking on the video will show up a contextual menu with the following options:



Option	Description
Snap	Takes a snapshot of the video and stores it in the media folder.
Play/Pause	Pauses and plays the video.
Stop	Stops the video playing.

14.4.2 Video Playback options on the Video Toolbar

The Video Toolbar is displayed when the mouse is placed near the bottom edge of a video player:



The toolbar items vary depending on the video source type: stream, file or nDVR. The following table describes all the available commands:

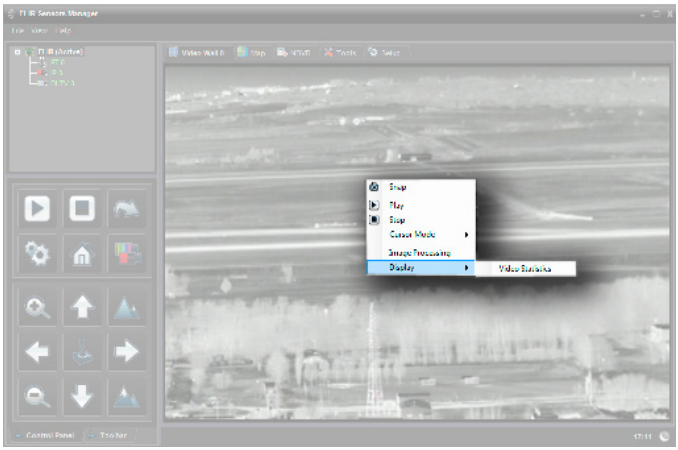
Option	Description
Play/Pause	Pauses/resumes the playback.
Snap	Takes a snapshot of the video and stores it in the media folder.
Select Speed	Sets the playback speed. (NDVR only)
Skip Backwards	Skips as many minutes as the speed factor backwards. (NDVR only)
Skip Forward	Skips as many minutes as the speed factor forwards. (NDVR only)
Seek	Allows setting the playback to any position. (NDVR and files only)

14.4.3 Auto Hide Option

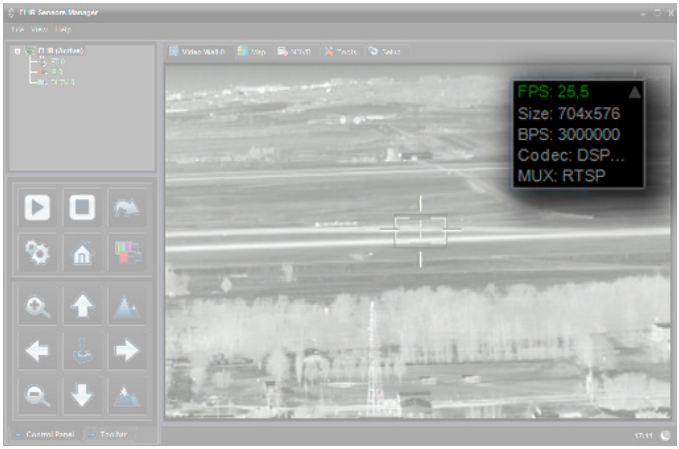
The video toolbar is set to itself by default; it is possible to change this setting by right-clicking on it and checking or Unchecking this option.

14.5 Video Statistics

To get the video statistics associated with the video, right-click on the video window and select Display → Video Statistics:

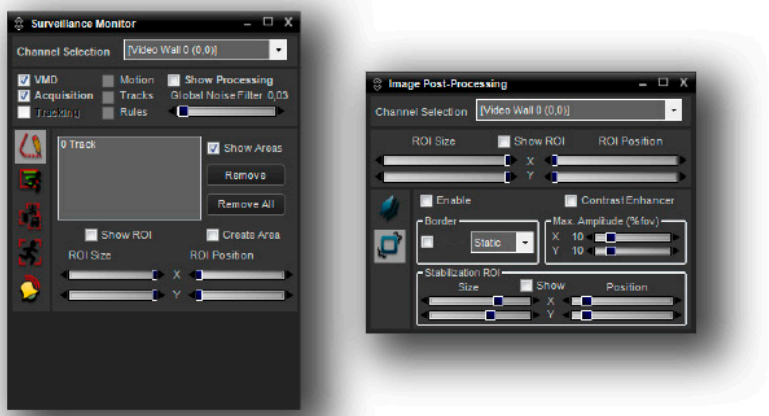


The upper right corner of the video window begins to display the Frames per Second; clicking on the arrow expands the displayed information:



15 Video Surveillance

FSM is able to perform several Image Processing algorithms in order to follow and detect targets and movement in the video. Activating Image Processing also allows the user to do some Image Post-Processing processes such as the Electronic Stabilization (eStab) and activating the On Screen Display.



This section will be divided in three parts: Surveillance Monitor, Image Post-Processing and OSD.

15.1 Basic concepts

The following are important concepts to know before setting up a surveillance monitoring system.

ROI (Region of Interest): Defines the region of the video that will be analyzed by any of the image post processing algorithms. Everything inside the ROI will be processed, whereas everything outside of it will be ignored by the surveillance algorithms. The scroll bars of the ROI section can adjust the size and the position of the ROI as well as making it visible or not on the video window. This concept is common for VMD, Acquisition and Tracking.

Areas: Areas are portions of video on which the intelligent video algorithms will create motion alarms (VMD) or entering/exiting alarms (Target Acquisition). There is also a special area type (Blanking) where the intelligent video algorithms are disabled. It is possible to draw several areas of the same or of

different types on the same video channel. The following area types are supported:

Area type	Applies to	Consists of
Blanking	Acquisition	Processing engine is disabled
VMD	VMD	VMD algorithm is active
Acquisition	Acquisition	Target Acquisition engine is active
VMD and Acquisition	VMD and Acquisition	Both VMD and Acquisition rules engines are active
Wire	Acquisition	An open, multi-segment line over which the Acquisition rules are active

Rules: A rule is a set of conditions that may trigger an alarm. It is possible to assign one or more rules to each defined area. Depending on the area type, these rules may be:

Type of area	Possible rules	
VMD	No rules	
Acquisition	Enter, Exit, Both	Object detected upon entering, leaving, or entering and leaving selected area
VMD and Acquisition	Enter, Exit, Both	Object detected upon entering, leaving, or entering and leaving selected area
Wire	Right → Left Left → Right Any Crossing	Object detected upon crossing right to left, left to right or when crossing the selected area in any direction

Global Noise Filter: Some environments may produce noisy videos either because the camera is not generating a clean picture or because there are trees with leaves moving and generating small sun reflections for example. The Global Noise Filter helps reducing false alarms in these situations.

This is a statistical filter that discriminates between real changes on the image and the inter-frame differences generated by analogical video signal noise, or by the video compression algorithms, or by noise in the background. Lower values should be used for high compression or noisy images or backgrounds, and higher values for good quality, low noise video.

The default value (0.03) has been proved to be adequate for most situations.

Please note that this setting affects both VMD and Acquisition algorithm.

15.2 Differences between Surveillance modes

The Surveillance Monitor allows three different supervision modes: Video Motion Detection (VMD), Acquisition, and Tracking.

Situation	VMD	Acquisition	Tracking
Raise an alarm when detecting any movement in the specified areas	X		
Raise alarms based on specific rules such as target sizes, crossing a line in a certain direction, entering and leaving an area, target speed, etc		X	
Command the camera to follow an specific target always keeping it in the Field Of View (FOV)			X

These three surveillance modes can be combined in any way needed in order to approach the desired behavior.

15.3 Surveillance Monitor

The video Surveillance Monitor offers a set of tools to allow the user to take full advantage of the surveillance capacity of the sensor network system. This Section shows how to set up the surveillance system using the VMD (Video Motion Detection) algorithm, the Target Acquisition algorithm, or a combination of the two.

The Surveillance Monitor window is located in the View menu. View → Surveillance Monitor.

#	Item	Description
1	Channel Selection	This dropdown menu shows all the available tiles with Image Processing activated
2	General Options	Common options for VMD, Acquisition and Tracking
3	Areas tab	Create and remove areas as well as changing the Region Of Interest (ROI) of the selected tile
4	VMD tab	Manage VMD Areas. Change each sensitivity and movement minimum sizes. VMD has to be checked in the General Options in order to use VMD features
5	Acquisition tab	Customize the algorithm, target Sizes, Times, Rules, etc. Acquisition has to be checked in the General Options in order to use Acquisition features
6	Tracking tab	Select the tracking algorithm as well as the tracking gate size
7	Alarms tab	When an alarm happens, this tab allows the user to configure the automatic emails, snapping images, slewing on a different sensor or connect an IO device

15.4 Areas and Wires

A surveillance system has two different zone types: Areas and Wires.

- **Areas:** A user defined polygon with up to 20 vertexes where a surveillance process will be ran. Areas will allow the system to create analytics rules such as Alarm on entering tracks or alarm on leaving tracks.
- **Wires:** A user defined multipoint line that allows the operator to create rules such as crossing from left to right or from right to left.

15.4.1 Creating Areas/Wires

The Edit function allows the user to create specific surveillance areas on the screen where a VMD, Acquisition or Tracking algorithm will work. The area drawn is a polygon and can accommodate any shape the user wants, as could be the case in a zone close to a gate, or along a fence. For simplicity, in this example we are using a four-sided box.

1 Click the **Edit Area** button located on the Toolbar.

2 Position the cursor on the desired location to begin drawing the area by left clicking. At this point a contextual menu will come up with the possible area types (in this case VMD).

3 Keep drawing the area, closing the polygon by double clicking.

4 When the user closes the area an identifier appears. The first area created is marked with a 0. Subsequent areas will be marked with 1, 2, etc.

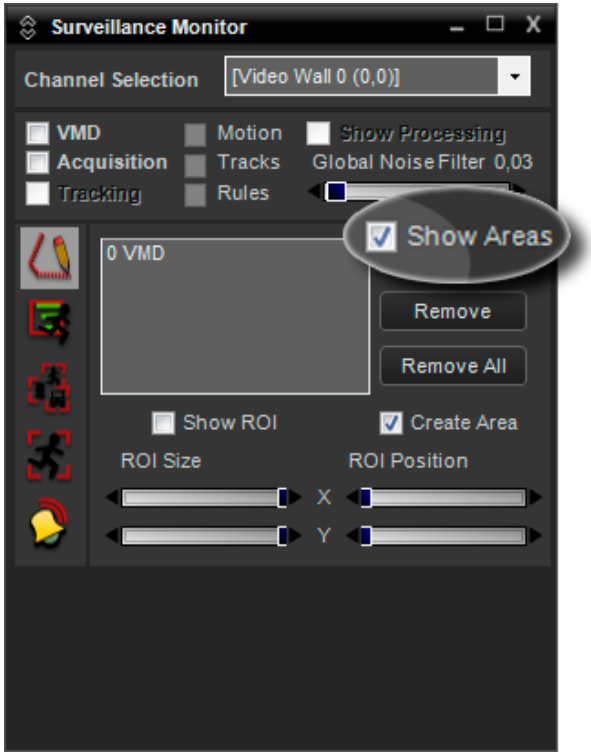
5 Remember to check the appropriate algorithm from the Surveillance Monitor → General Options in order to start processing the information on the selected Video Tile.

Up to 10 areas can be drawn on the displayed video window. Each area can be created using up to 20 vertexes (points in the polygon).

Note: The user can also enable the Create Area checkbox from the Surveillance Monitor, which turns on the Edit Area icon (pen). This is an alternative way to creating an area from within the Surveillance Monitor window, instead of simply clicking on the Edit Areaicon on the Toolbar.

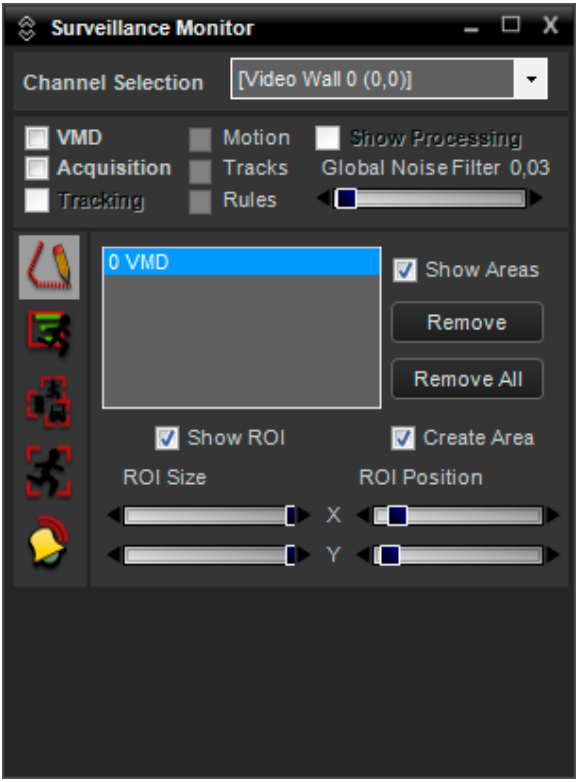
15.4.2 Deleting Areas/Wires

An area can be deleted from Surveillance system. To do so, open the Surveillance Monitor on View → Surveillance Monitor.



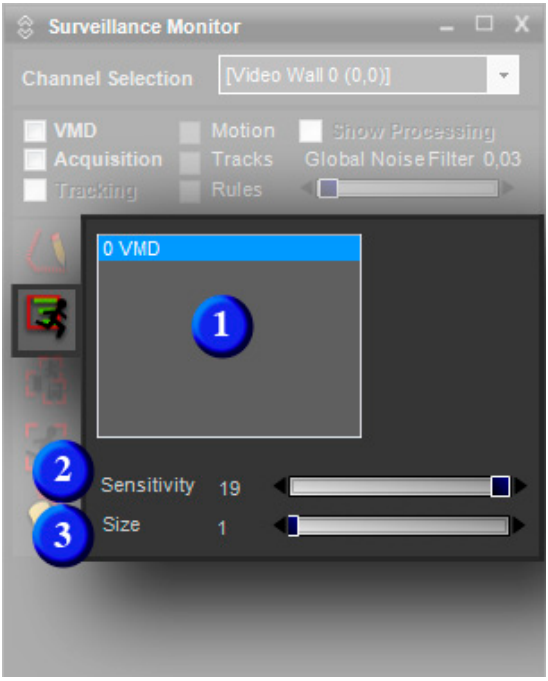
The Surveillance Monitor window is displayed.

1 Click on the top icon on the left-hand side (the pen icon) to list the existing areas.
2 Make sure the Show Areas box is checked.
3 Select the area and click the Remove button.



15.4.3 VMD Parameters

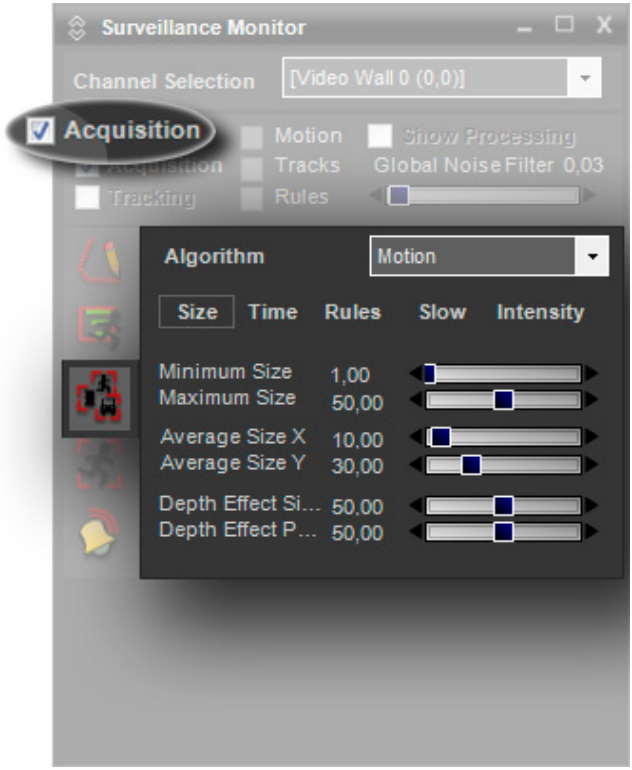
Sometimes an alarm is triggered by moving elements that are of no interest. Typical examples are the moving leaves of trees, or the traffic on a distant road. It is possible to adjust the alarm trigger sensitive in order to ignore these false alarms. To achieve this, some parameters like Global Noise Filter, Sensitivity and Size can be adjusted on the VMD tab



#	Parameter	Description
1	VMD Areas List	List of all the VMD Areas. Acquisition areas will not be shown here
2	Sensitivity	Ranges from 1 to 20. Higher value means more sensitivity and finest movement needed to rise an alarm
3	Size	Defines the percentage of the area that should be classified as moving for the algorithm to trigger and alarm.

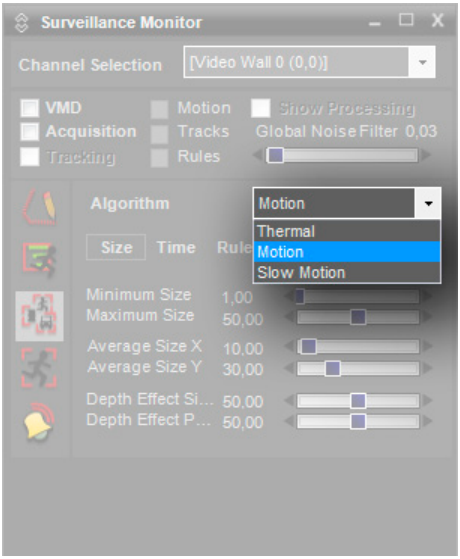
15.5 Acquisition Parameters

The Acquisition system is a group of algorithms intended to detect mobile or static targets and tag them with a unique ID in order to apply certain rules and algorithms to perform more detailed video analytics. In order for the acquisition parameters to take effect, the Acquisition checkbox should be checked.



15.5.1 Acquisition Algorithms

There are three algorithms to be used depending on each situation.



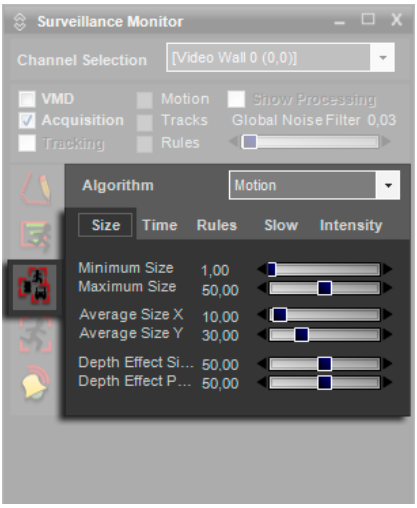
Situation	Thermal	Motion	Slow Motion
Targets are easy to identify because of its temperature and should be detected even when they are not moving. Example: Cars in a motorway, helicopters, animals, etc	X		
Targets are always moving and not necessarily viewed with a thermal camera. Example: People, cars in the city, doors opening		X	
Targets are moving very slow. Examples: Sailboats, airplanes on the horizon			X

15.5.2 Acquisition Sizes

It is good to have an idea of how the expected targets will look like so the algorithm has accurate data in order to discard smaller and larger targets than the estimated.

The Show Processing option may be checked in order to make the size adjustment easier.

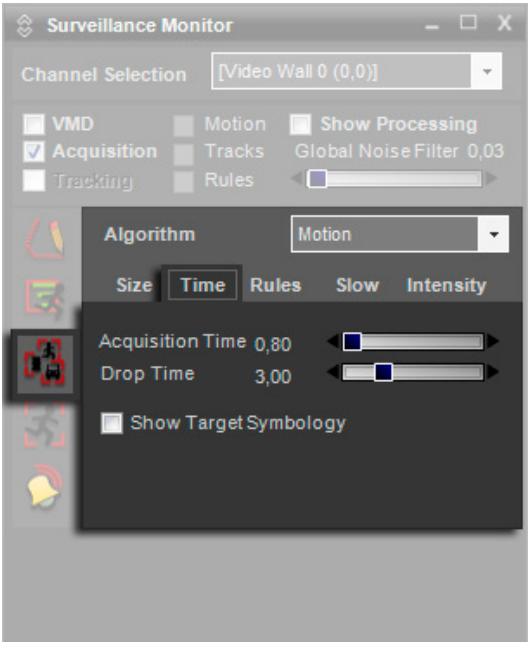
Once these values are set, the Show Processing checkbox should be unchecked to see the video normally with the Target Acquisition algorithm running on it.



Parameter	Description
Minimum Size	Minimum size range in a percentage scheme relative to the total size in pixels of the video image for the target.
Maximum Size	Maximum size range in a percentage scheme relative to the total size in pixels of the video image for the target.
Average Size X	The Average Size X defines the target width.
Average Size Y	The Average Size Y defines the target height.
Depth Effect Size	Relates the size of the target with the image perspective (background). A red square will show up in the left hand side of the video to help setting this parameter up.
Depth Effect Position	Relates the position of the target in the image with its size previously defined. A red square will show up in the left hand side of the video to help setting this parameter up.

15.5.3 Acquisition Time

This tab contains the controls to be used if the target has to be acquired immediately or after a certain time

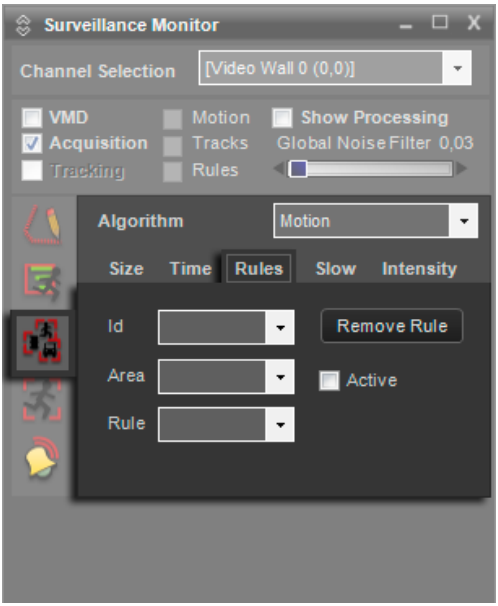


Parameter	Description
Acquisition Time	Time (in seconds) elapsed between target appearing and the algorithm marking it with its appropriate ID.
Drop Time	Represents the time (in seconds) elapsed between a target disappearing from the ROI and the moment when the algorithm stops searching for the lost target using predictive trajectory analysis methods.
Show Target Symbology	Displays the path followed by each acquired target.

15.5.4 Acquisition Rules

Having a virtual fence is very common in security installations and it is as easy as creating a line (wire) and a rule to raise an alarm whenever this virtual line is crossed.

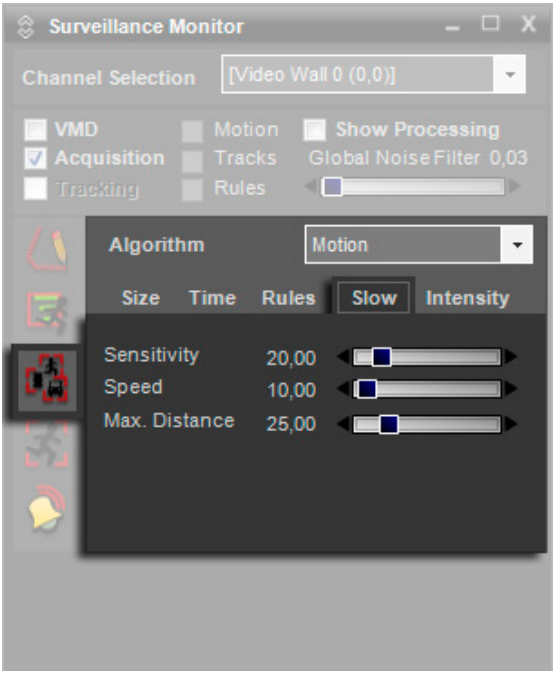
The Rules tab described below contains all the settings for this kind of surveillance setup.



Parameter	Description
ID	ID of the current rule
Area	Associated Area to be used with the current rule
Rule	Rule description. Shown options will be different for wires and areas. Refer to section 15.1 for more information about rules.
Remove Rule	Removes the current rule
Active	Enables or disables the current rule

15.5.5 Slow Motion Acquisition

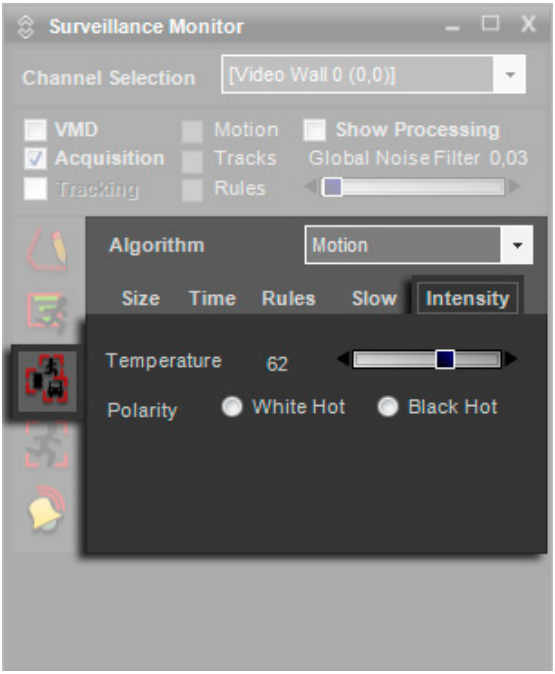
When the target is moving slowly, like a boat moving far from the camera, the Slow Motion algorithm should be used. The parameters to set up this algorithm are contained in this section.



Parameter	Description
Sensitivity	Higher values indicate a more sensitive algorithm, thus creating more possible targets.
Speed	Indicates the expected speed of the targets to be acquired. Higher value indicates the algorithm to look for faster tracks.
Max Distance	Refers to the statistical distance between targets when predicting motion. This parameter must be set to prevent the algorithm from merging two close moving targets into a single target. Lower values should be set when moving targets are expected to get very close.

15.5.6 Intensity Acquisition

If the acquisition is being done with the Intensity algorithm, some parameters will need to be set in this section.



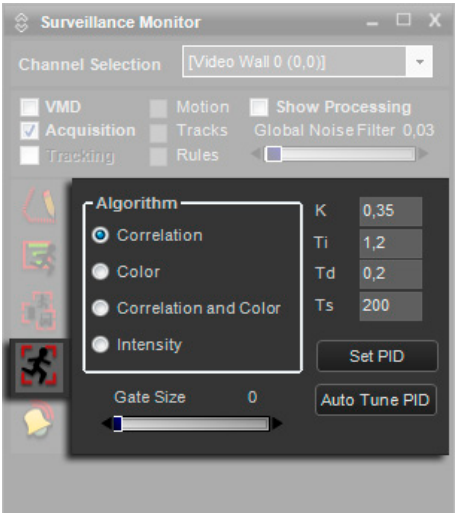
Parameter	Description
Temperature	This value sets the thermal intensity of the target. This is a percentage value with respect to the whole picture. Please take into account that the video does not usually contain any actual temperature of each pixel. The color shown depends on the LUT (Look Up Table, aka Palette) and the overall temperature of the whole image. Therefore, this parameter should be set with several videos in different temperature situations such as night, day, winter, summer, etc.
Polarity	Most of the cameras allow different LUT configurations, two of the most common ones are White Hot and Black Hot. These are the ones to be used with this algorithm. Any other LUT will not work with this algorithm.

15.6 Tracking Parameters

FSM allows the user to set a specific target and make the camera track it autonomously. The tracking system will work better if the appropriate algorithm is selected as well as the Gate Size is set to the right expected target size.

The tracker can be enabled by Shift-clicking on the video while the Aim cursor mode is enabled or by double-clicking in the video window. To disable the video tracker, just click on the video once.

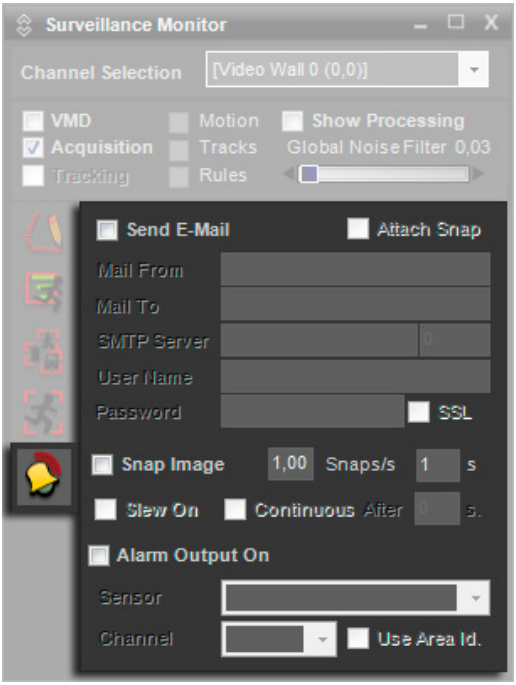
The Tracking check box, located on the general area of the Surveillance Monitor, would be checked if the tracker is enabled.



Parameter	Description
Correlation	Tracks based on a contour (shape) pattern in the image.
Color	Tracks based on a color pattern in the image.
Correlation and Color	Combines both of the above.
Intensity	Looks for targets over a threshold in the image (can be seen as a temperature threshold when working with an IR). Applies only to IR cameras.
Gate Size	Sets the area where the algorithm will get patterns.

15.7 Alarm Parameters

The alarms section contains the controls needed to manage the actions to be taken when a video alarm is triggered.



Parameter	Description
Send E-Mail	Sends an e-mail using the configured accounts settings.
Snap Image	Creates a series of snapshots based on the speed and time set and stores it in the media folder. These snaps can be attached to the sent e-mails by enabling the Attach Snap check box.
Slew On	Commands an associated sensor to aim at the alarm source. This function needs to be enabled also in the Nexus Sensor.
Alarm Output On	Enables an associated I/O sensor output when an alarm happens.

15.8 Setting up a Surveillance System using Acquisition algorithms

Depending on the source of the video and the motion parameters of targets to be detected, the most appropriate algorithm should be selected. Below is a typical procedure for setting up a surveillance system based on the Motion Acquisition algorithm.

1 Open the Surveillance Monitor and check the **Acquisition check box**. Set the ROI by making sure to enable the **Show ROI** check box and use the sliders to set the desired area:

2 Select the appropriate Target Acquisition algorithm depending on the needs and sensor type (Thermal, Motion, Slow Motion). For this example, the Motion Target algorithm is selected. Enable also the Show Processing box, so the image should now display on the video window as follows:

Notice how the algorithm is processing the movements produced inside the ROI. If the algorithm is classifying as motion what is actually background noise (moving leaves) some fine tuning can be done by adjusting the Global Noise Filter slider described in section 15.1.

15.9 Grouping Target Fragments into a Single Target

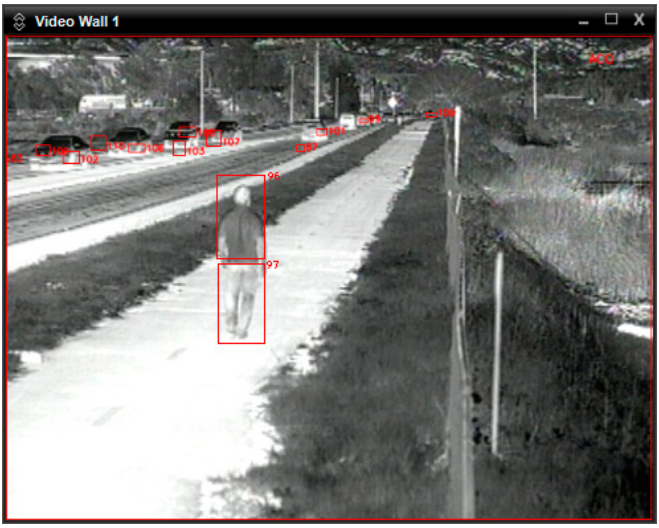
Sometimes the default target size configuration leads to fragmented targets and too many track IDs created. This section will explain how to set those parameters in order to achieve a better target tracking.

Just to remember some terminology from previous chapters, here are some comments about Size settings:

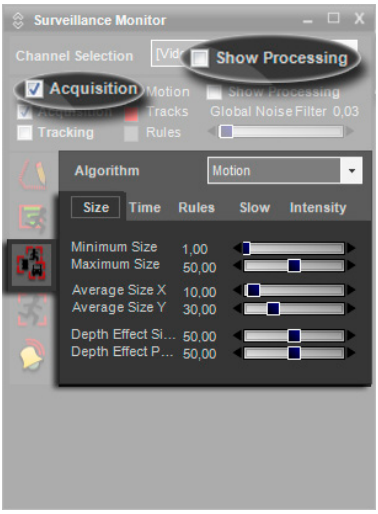
- The Average Size value is related to the size of the target (width and height).
- The Depth Effect value is related to the size and position of the target when this target is located far in the image perspective (background).

Please refer to Section 15.5.2 Acquisition Sizes for more information about these parameters.

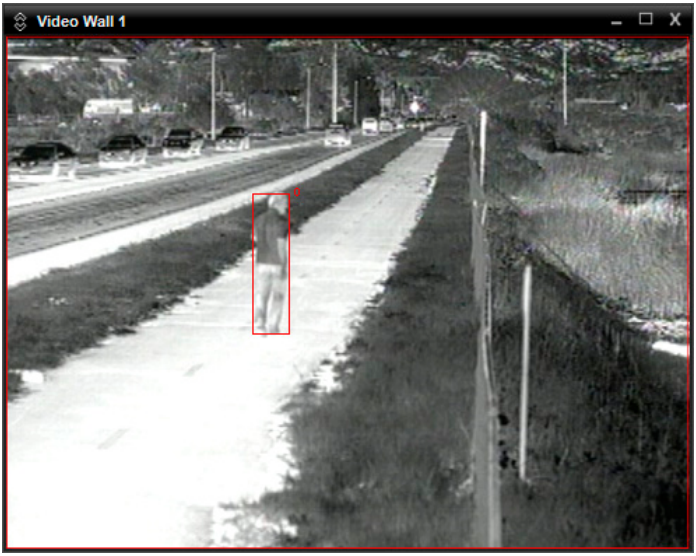
The image below shows a typical example of a fragmented target acquisition and some instructions on how to configure these parameters.



1 Open the Surveillance Monitor and set the ROI. Make sure to enable the Show ROI check box to display the ROI on screen.
2 Select the appropriate Target Acquisition algorithm depending on the needs and sensor type (Thermal, Motion, Slow Motion). For this example, the Motion Target algorithm is selected.
3 Select the Size section and change the Average Size parameters.
As soon as these values are changed, two red squares appear on the video channel window. The one located on the lower left corner of the video corresponds to the Average Size parameter and the one located above corresponds to the Depth Effect parameter.
The Average Size slider should be set to match the target size (including shadow) on the foreground.
4 Target clustering in the background is managed with the Size and Position sliders in the Depth Effect section.
The Position slider selects the position (depth) at which the farthest target may be grouped.
The Size sliders set the size percentage of the background target associated with the setting already fixed to the foreground. The rest of values in between foreground and background are just interpolated.



5 After adjusting these two parameters the Acquisition algorithm is able to process each target as a whole object and discard any object on the background that is not of interest for the video analysis.

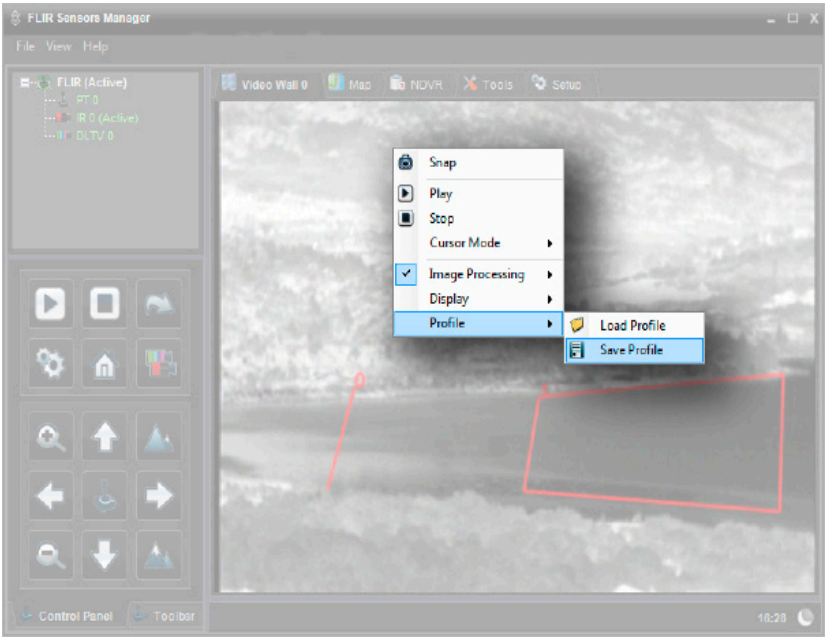


15.10 Video Profiles Management

A user can save and load video settings from any Image Processing enabled video window. These video settings are stored in the video profile folder, usually C:\Program Files\FLIR Sensors Manager 2012\vpp.

15.10.1 Saving a Video Profile

1 Make sure the Image Processing is activated and it contains all the right Areas, Rules and OSD settings.
2 Right-click on the video window and select the Save Profile option.

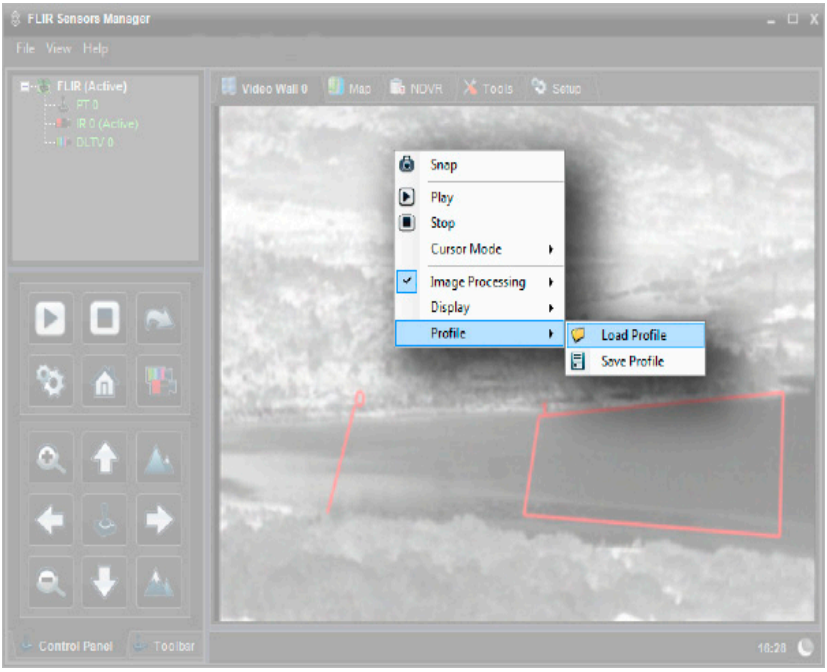


3 Give the file a name. FSM does not need any special name, but it is useful to save it with the following structure just to make it easy.
<Server Name>_Dev<Device ID>_Res<Resolution>_<Scan List Position>.xml

15.10.2 Loading a Video Profile

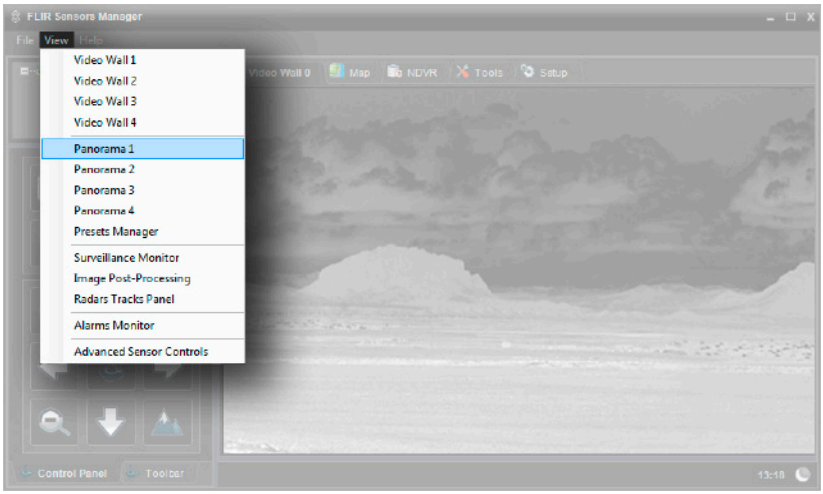
A video profile can be loaded just if Image Processing is active and the resolution of the actual video corresponds to the one used to create the Video Profile.

1 Make sure Image Processing is activated and video resolution matches the one used for the file to be loaded.
2 Right-click in the video window and select the Load Profile option.



16 Panorama

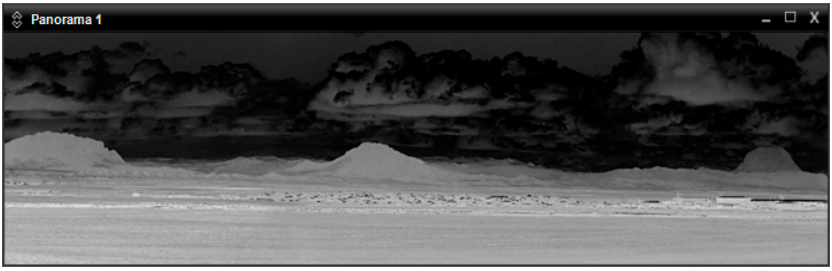
Working with several motorized cameras might be confusing if the operator does not know the area well enough. The Panorama tool allows users to create panoramic views of the field with a Pan and tilt unit and use them for pointing at the right spots or locating Waypoints in the area.
Panoramas are usually done with DLTV cameras so the operator has a clear idea of where is pointing, but it is possible to do it with IR cameras as well. All the available panoramas are located on View → Panorama.



16.1 Creating a new Panorama

These are the steps to follow in order to create a new Panorama:

1 Make sure the Current Active Sensor has a Pan and Tilt unit, is the active sensor and control has been obtained.
2 Open the video stream in any of the available Video Walls. Otherwise FSM will not be able to take the required video snaps.
3 Set the right zoom and elevation parameters to be used for the panorama. Also, select the appropriate OSD and Video Analytics configuration.
4 Go to View → Panorama and choose the panorama to be used.
5 Right-clicking on the Panorama surface displays the panoramic view, creation and updating options.



6 Go to the Create New Panorama section and select the most appropriate panorama based on the angle to be covered and the camera used.
FSM will automatically create a new Presets list based on the current FOV so the number of snapshots will be different depending on the zoom applied. The Update option will be automatically checked.
7 Use the Hand cursor (H) to move around the panorama.
8 Once the panorama is completed, uncheck the Update option by right-clicking on the panorama.
Right-click on the panorama and select the Save option. Give the current panorama a name and click the Save button.

16.2 Loading Panoramas

Only panoramas from the active sensor can be loaded on any panorama window.

Loading a panorama can be done by right-clicking on any Panorama window and selecting the Load option.

Having several Panoramas of a certain area will allow the user to divide the field into different windows and place them anywhere in the screen.

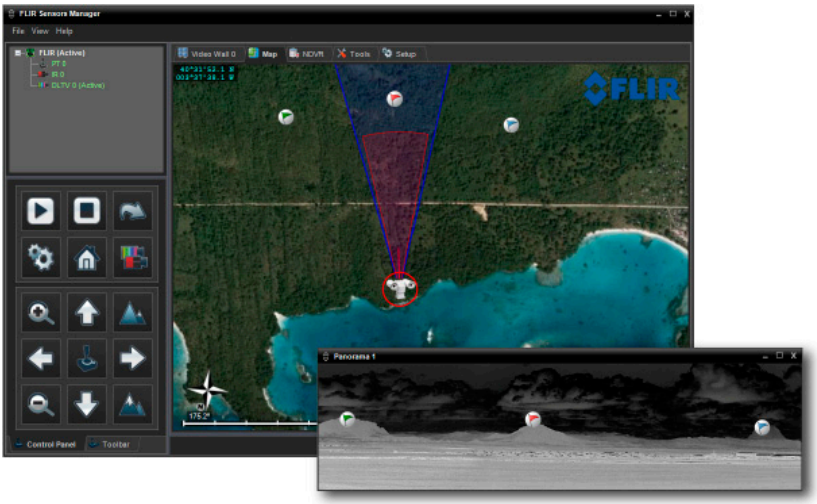
16.3 Using the panorama for accurate aiming

Using the Aim cursor (See section 5.2) mode or double-clicking on a point in the panorama makes the camera point at the specified spot:

Also, the operator can zoom in and out the Panorama with the mouse wheel or the keyboard shortcuts.

16.4 Showing Waypoints on the Panorama

FSM is able to overlay information layers on the Panorama. If the Map contains Waypoints, it is possible to show these waypoints also on the Panorama. To show the Waypoints on the Panorama, right click on the panorama window and select the view menu.

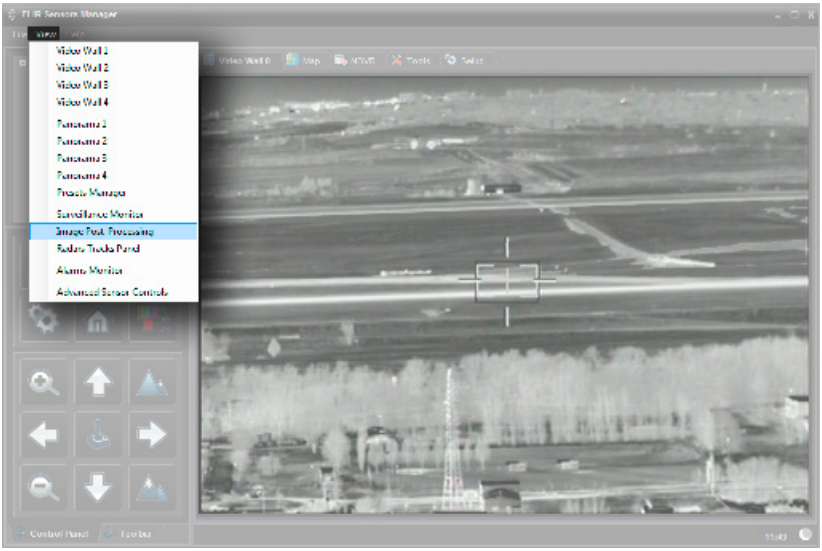


16.5 Panorama Keyboard Shortcuts

Action	Shortcut
Arrow cursor mode (no action)	A
Hand cursor mode (pan)	H
Reticule cursor mode (aim)	R
Zoom in/out cursor mode	Z/Shift + Z
Zoom in/zoom out	Mouse Wheel
Panorama	Mouse double click

17 Image Post-Processing

The image post-processing module allows managing the image filters and the electronic stabilization. To view the post-processing module, click the View → Image Post-Processing.



17.1 General Settings

The image post-processing module manages the selected video channel. The channels can be selected via the channel selection drop down list, or by clicking on the adequate video wall video player.

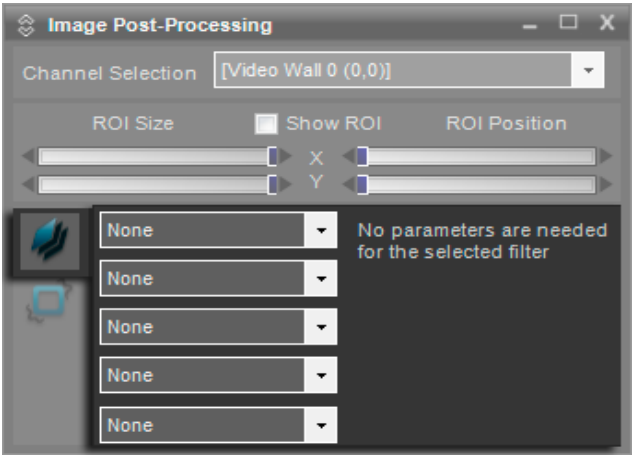
NOTE: To be selectable, the video channel must have the video post-processing option (VPP) enabled beforehand.

The main features are managed with the common controls placed right below the channel selection drop down list.

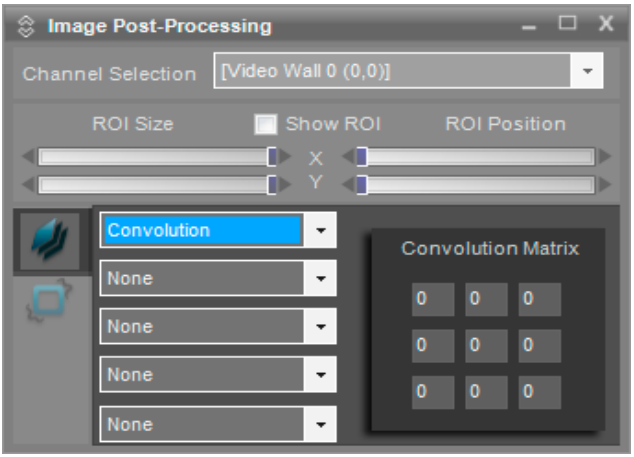
The specific features controls are placed in the corresponding sections. The sections can be accessed by clicking on the sidebar icons.

17.2 Filters

The filters section contains the controls needed to manage the image filters layers and parameters:

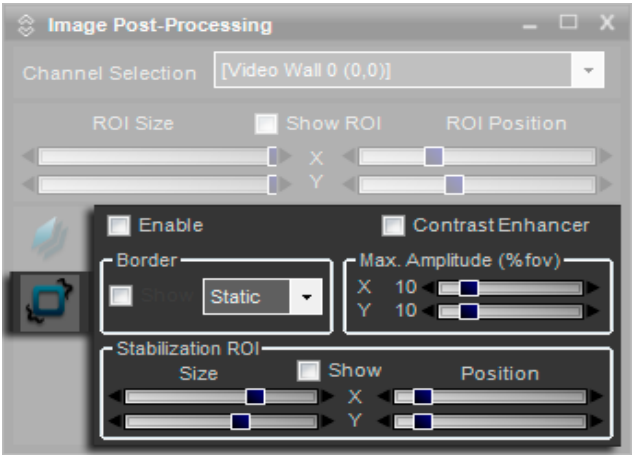


If parameters are applied to the selected filter, these will be shown next to the filters drop down list. The convolution filter parameters are shown on the following image as an example.



17.3 Stabilization

The stabilization section contains the controls needed to manage the electronic stabilization (eStab) and its parameters:



The Border, Max. Amplitude (%FOV) and Stabilization ROI group boxes, as well as the Contrast Enhancer check box, allow setting the electronic stabilization parameters.

The **Enable** checkbox is used to enable and disable the stabilization.

17.3.1 Principle of Operation

There are two ways to use eStab: fully automatic mode and semi-automatic mode. The operating mode is selected by choosing the Border mode. If Border mode is set to Dynamic the algorithm will automatically adjust the stabilization parameters to the vibration schema in the image. In this case the Max amplitude sliders are ignored.

If Border mode is set to Static, then the Max amplitude sliders will have to be manually adjusted by the user to match the vibration's dynamic range on the video.

17.3.2 Setting up the Stabilization ROI

Ideally, no Streamed OSD should be displayed on the video. If this is not possible, the Stabilization ROI can be used to exclude any static text or logo from the

computing area, in order to optimize the performance of the eStab algorithms. The Stabilization checkbox must remain unchecked while adjusting the stabilization ROI.

Any black/blank border should be excluded from the computing area (left out of the stabilization ROI), in order to allow enough information for the algorithm to work properly. The Stabilization ROI can be hidden once setup is completed. eStab can now be enabled by clicking on the enable check box.

17.3.3 ROI and Contrast Examples

This section contains some typical stabilization examples that may be used as guidelines for other scenarios.

17.3.3.1 Example 1: Streamed OSD and Black Borders

The video of the image below shows the most adverse situation for eStab: Static OSD and black border on the image. The first step should be to remove or minimize the static camera symbology on the image (declutter).

17.3.3.2 Example 2: Low Contrast

In the picture below, the camera symbology has been removed and the stabilization ROI (shown as green polygon) was adjusted to avoid the black border on the left. Video contrast is very low, making this image a good candidate to enable the Contrast Enhancement feature. Doing this will not show any difference in the displayed video but will highly improve the performance of the eStab algorithm.

17.3.3.3 Example 3: Low contrast and FSM OSD

In this picture an OSD has been added using FSM, which is different that a streamed OSD. These symbols do not affect eStab since they are added after the processing filters, and can be used to restore the information that is missing when the camera symbology was removed. A different AGC algorithm has been selected to improve the camera's contrast.

17.3.4 Adjusting Amplitude Parameters

If eStab is set to fully automatic mode (Border mode: Dynamic), the settings in the amplitude sliders are ignored.

If eStab is in semi-automatic mode (Border mode: Static) the amplitude sliders must be set to match the vibration magnitude on X and Y axis of the video.

To make these adjustments, Border Show should be disabled. This is necessary in order to be able to see the black border around the image when it is being adjusted. The width and height of this border has to be greater in pixels than the maximum vibrations to damp on the image, on X and Y.

Start on the maximum (sliders to the right) and start decreasing the value until the balance between image size/stillness of the image is optimum. Notice that amplitude can be adjusted independently for X and Y axis.

17.3.5 Show Border

This setting can be used when eStab is in semi-automatic mode (Border mode: Static) and the User cannot afford missing any portion of the field of view while the image is being stabilized (maximum situational awareness). It is also useful to confirm that stabilization is working properly.

17.3.6 Contrast Enhancer

On low contrast situations, especially on IR cameras, a contrast boost filter may be necessary for eStab to deliver optimum performance. This is achieved by activating the Contrast Enhancer checkbox.

Enabling contrast enhancement will not show any difference in the displayed video but will highly improve the performance of the eStab algorithm. Contrast enhancement is never recommended for stabilizing DLTV (color) video images.

17.3.7 Troubleshooting and Limitations

Here are some tips for troubleshooting and limitations of the eStab functionality.

17.3.7.1 Integration Time

eStab works with periods below integration times. If the period of the vibration frequency is shorter that the integration time used in the detector of the camera, eStab will be considerably less effective.

17.3.7.2 CPU Usage

If the requirements specified under hardware requirements are met, the CPU load used by FLIR Sensors Manager should remain always under 80% for the given number of videos in use. If blocking or sputtering artifacts are shown in the video, the CPU utilization graph should be checked.

In order to lower the CPU load the video size can be reduced in the encoder or frame grabber. In an overload situation any additional post processing filters that may have been inserted (VMD, Tracker, etc) should be removed in order to allow the eStab algorithm to work properly.

17.3.7.3 Limitations

The following video or image quality situations may reduce eStab performance:

17.3.7.3.1 Noisy Video

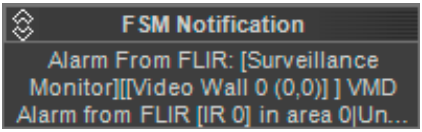
Gaussian noise patterns, like the one showed on the following sample image, will considerably affect the performance of the eStab algorithms.

17.3.7.3.2 Very Low Resolution Video

This situation is common when the input resolution is CIF and the electronic zoom is enabled in the camera. The effective resolution in these cases is calculated as: (input resolution)/ eZoom multiplier factor.

18 Alarms Management

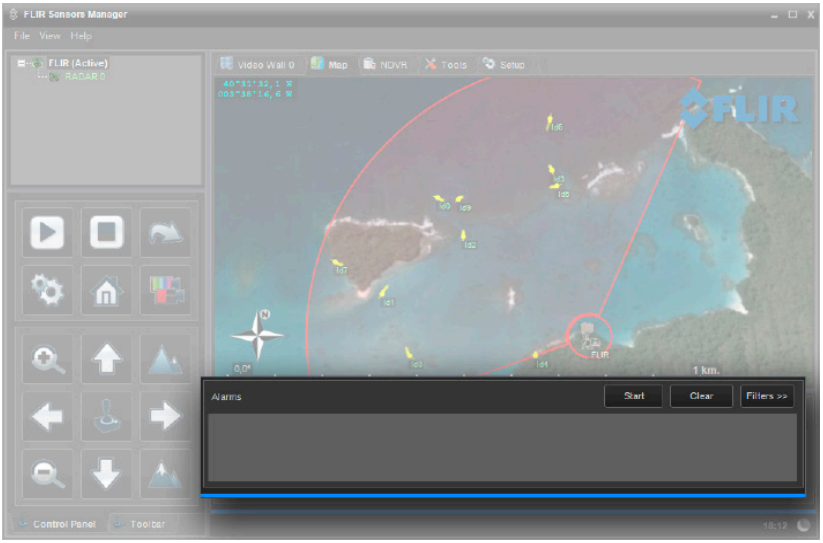
FSM is able to manage different alarms coming from remote network sensors as well as local video analytics. These alarms are always shown as FSM notifications and can have an associated sound as seen in chapter 20.



There are two specific tools to manage the alarms: The Alarm Panel and the Alarms Manager.

18.1 Alarms Panel

The Alarm Panel is shown when clicking or leaving the mouse on the bar under the main panel.



18.1.1 Alarms Structure

All the alarms shown in this panel have the same structure:

[Date] Sensor Name: [Alarm Type] [[Origin]] Description [Device] Area ID | Geo information

Here is a real example of an alarm generated by some movement detected in a video tile:

[9/28/2011 11:29:21 AM] FLIR: [Surveillance Monitor] [[Video Wall 0 (0, 0)]] VMD Alarm from FLIR [DLTV 0] in area 0|Unknown|0|20110928112921702582 7|00N00’00.0” |000E00’00.0” |0

18.1.2 Alarm Filtering

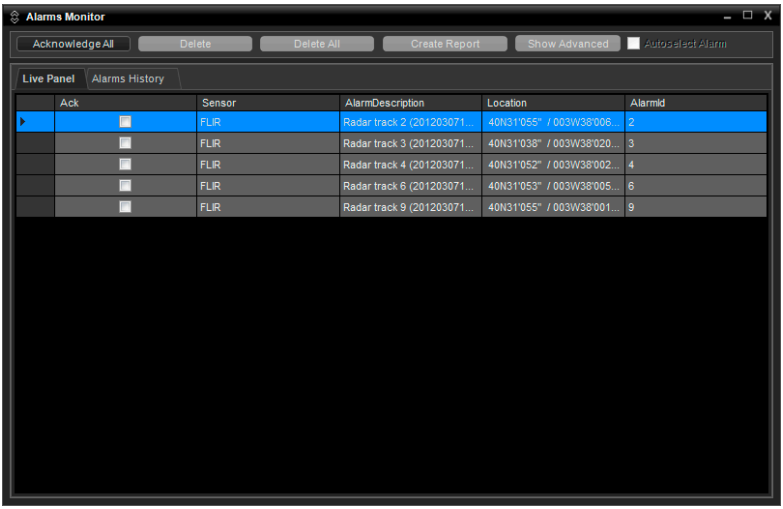
The alarms can be filtered by string and by sensor. These options can be shown or hidden via the Filters button.

18.2 Alarms Monitor

The Alarms Monitor module provides advanced functionalities for acknowledging, deleting and displaying snaps, recorded videos or even a live video stream. To display the Alarm Monitor go to View → Alarms Monitor.

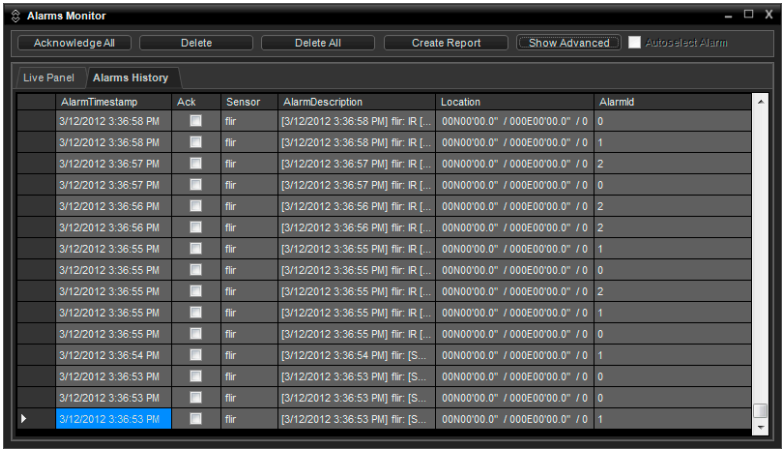
18.2.1 Live Panel

The Live Panel shows a live view of all the alarms as they happen. These alarms can be acknowledged and deleted from this panel.



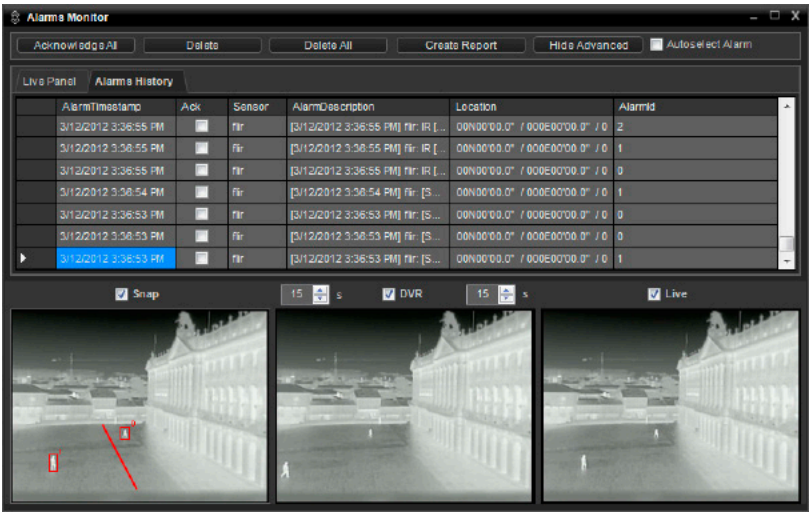
18.2.2 Alarms History Panel

The Alarms History Panel shows all the logged alarms and allows the operator to delete one, all or even create alarm reports.



18.2.3 Advanced Panel

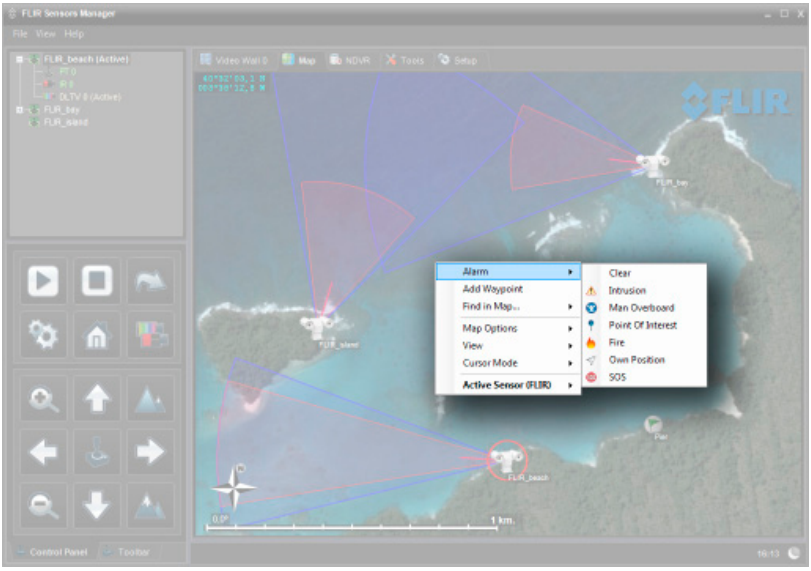
The Show Advanced button shows three video windows where a Snap of the alarm event, DVR channel recording, and the Live Video stream will be shown if available. To learn more about creating snaps, please read section 15.8.



18.3 Raising Alarms from the Map

When an operator observes fire or an intrusion with one of the installed cameras it might be required to raise an alarm manually so everyone in the network gets the alarm and acts accordingly.

With the default or a proper Nexus Sensor configuration, alarms can be manually raised by right-clicking on the map, selecting the Alarm Option and choosing the right alarm type.



Please make sure the Workstation Enable option is checked from the Setup → Preferences → General tab.

18.4 Exporting Alarms

Alarms are stored in a database file in the log folder. Any change will immediately affect the alarms database file. This file can be exported by clicking on the Create Report button. The file is exported as an .XML file, which can be opened with several applications, e.g. Microsoft Excel™.

The Alarms database is automatically backed up in an XML file and the running database is cleared every 1000 alarm events.

19 Tools tab

The tools tab contains 5 different sections: Media, Waypoints, Import/Export, Log and NMEA. Here is a description of all those sections.

19.1 Media Browser

The Media Browser lets the user see a list of files stored in the Media folder, i.e. snapshots saved from video, typically located at C:\Program Files\FLIR Sensors Manager\media, although it can be any other folder the user selects.

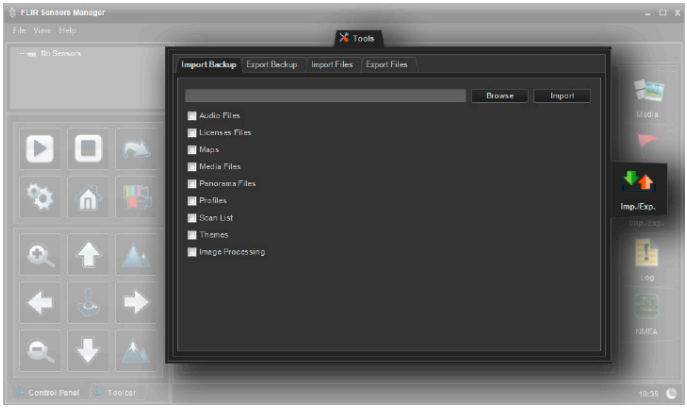
If the user wants to use another folder to store the media, go to the Setup tab, Preferences and change the Media folder path.

19.2 Waypoints

This section allows the user to manage the waypoints created on the Map.

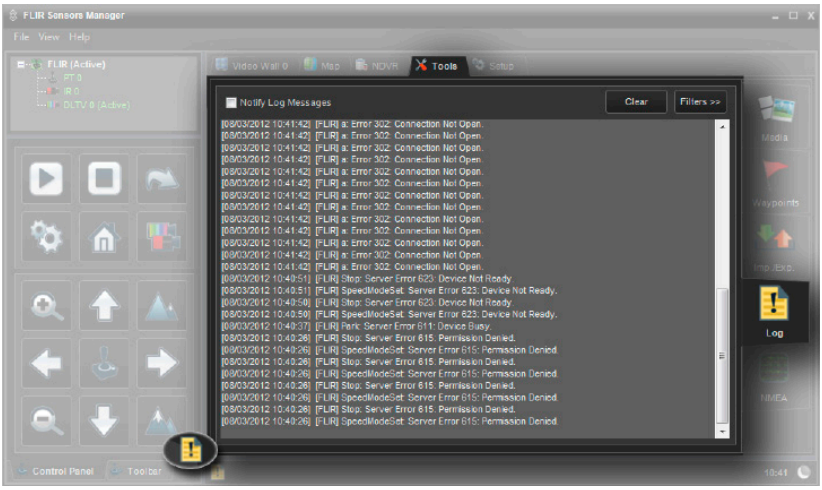
19.3 Import / Export

Here, all the controls to import and export the current FSM configuration can be found. There are four different tabs:



19.4 Log

The log panel displays the application status messages.



When a new log entry occurs, a log icon called Log Notification is shown in the lower part of FSM. If the Log Notification is clicked it will go off until a new one happens.

19.4.1 Log Structure

All the log entries have the same structure:

[Date] [Source] Action: Log type: Description.

Here is a real example of a typical log entry generated when the operator tries to move a camera without having control of the sensor.

[9/28/2011 11:15:47 AM] [PT-304_BCG] Stop: Server Error 615: Permission Denied.

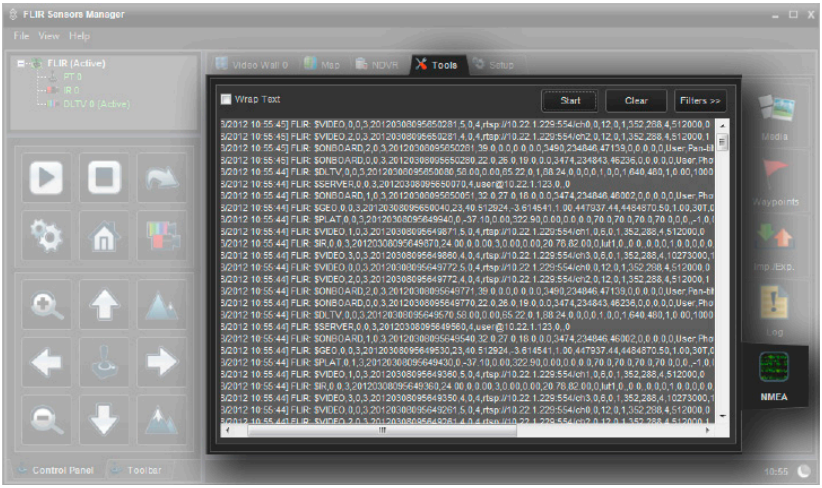
19.4.2 Log Filtering

The log messages can be filtered by string and by sensor. These options can be shown or hidden via the Filters button.

If the Notify Log Messages check box is checked, all log messages will also appear as a FSM Notification.

19.5 NMEA, Sensor status notifications

A log of all the NMEA communications is registered and shown in this tab. It is possible to filter any registered message using the Filters button.



19.5.1 NMEA Message Structure

This is the typical structure of a NMEA message:

[Date] Server Name: $Origin,NMEA Information

NMEAS may look very different depending on its origin, so just as an example, here is a typical NMEA coming from a Nexus Sensor:

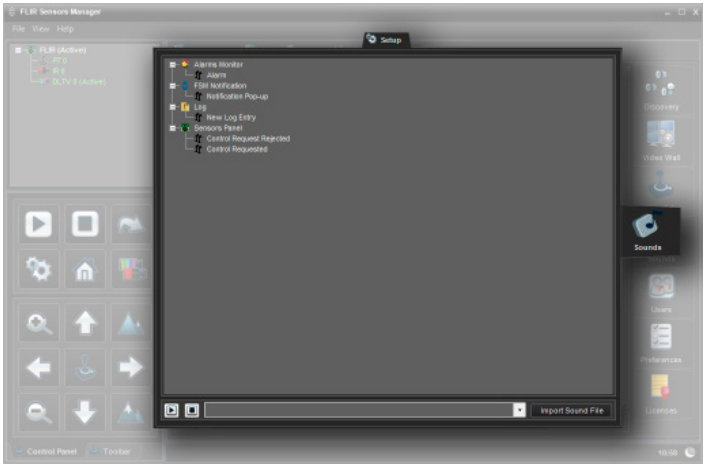
[09/28/2011 12:07:03] PT-304_BCG: $SERVER, 0, 0, 3, 19700106032854461, 2, user@10.10.51.60, 0, ,0

19.5.2 NMEA Message Filtering

The NMEA sentences can be filtered by string and by sensor just like the log messages. These options can be shown or hidden via the Filters button.

20 Sounds Manager

The Sounds Manager allows the user to assign specific sound files to different application events so the operator has sound alerts when an Alarm happens, Control was requested or a new log line was created.
The Sounds Manager is located on Setup → Sounds.



20.1 Sound Events

The following is a list of events that can have a sound assigned.

Event	Description
Alarm	FSM detects an alarm from a network sensor, local video analytics or radar.
Notification Pop-up	Every time a notification popup is shown in the low-right corner.
New Log entry	FSM records all its important events in a text Log, so this event will happen with every new log entry.
Control Request Rejected	If the user requested the control and it was rejected by the remote operator.
Control Requested	When a remote FSM requests the control of a camera currently being used by the local operator.

20.2 Supported File types

FSM supports .WAV and .MP3 files. Any other file will not be shown while importing the sounds into FSM.

21 Joystick Management

Joysticks allow operators to make use of almost all FSM functionality without having a keyboard or mouse. The joystick management module allows users to configure all joystick settings.

The joystick configuration menu can be found under Setup tab → Joystick.

21.1 Compatible Joysticks

FSM is compatible with most of the USB joysticks, both commercial and professional. The only requirement is for the device is to be DirectX compatible.

21.2 Setting up a new Joystick

As explained before, the joystick configuration tab is located under Setup tab → Joystick.

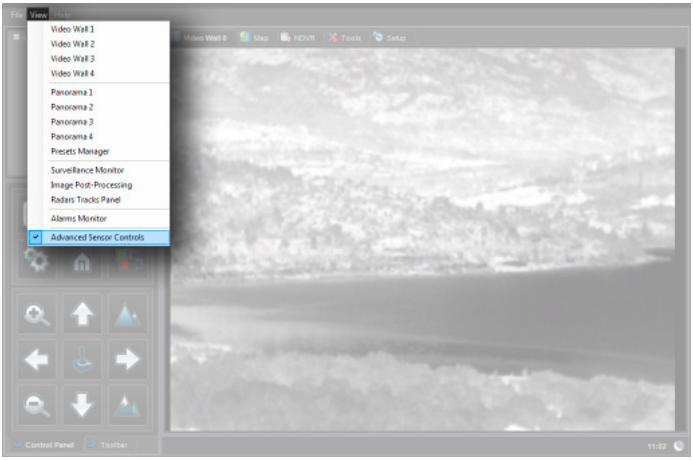
Once the joystick has been connected to a USB port, FSM will take a few seconds to display the device name in the first drop-down list. Then the configuration tab will get updated with all the detected hardware of the new device.

Note: Please take into account that not all the joysticks contain the same features and FSM adapts itself to each joystick specifications.

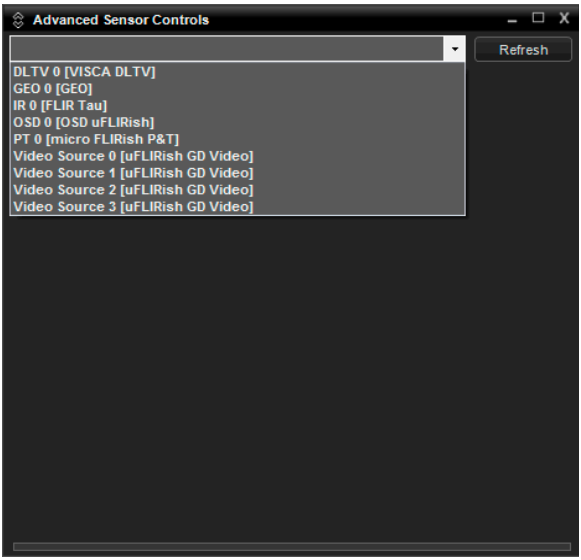
Name	
1 Joystick selector	Selects the joystick to be configured
2 Save Button	Stores the current configuration, making it active for the rest of the application.
3 Axes Panel	Sets the axes actions. Axes can be tested using the graphic bars beside the drop down list.
4 Buttons Panel	Sets each button actions, allowing setting different actions when the active camera is an IR (left column) and when the active camera is a DLTV (right column)
5 POV Positions Panel	Shows the position of the POV (Point Of View) stick.
6 POV Setup Panel	Sets the POVs' actions, allowing setting different actions when the active camera is a DLTV and when the active camera is an IR

22 Advanced Sensor Controls

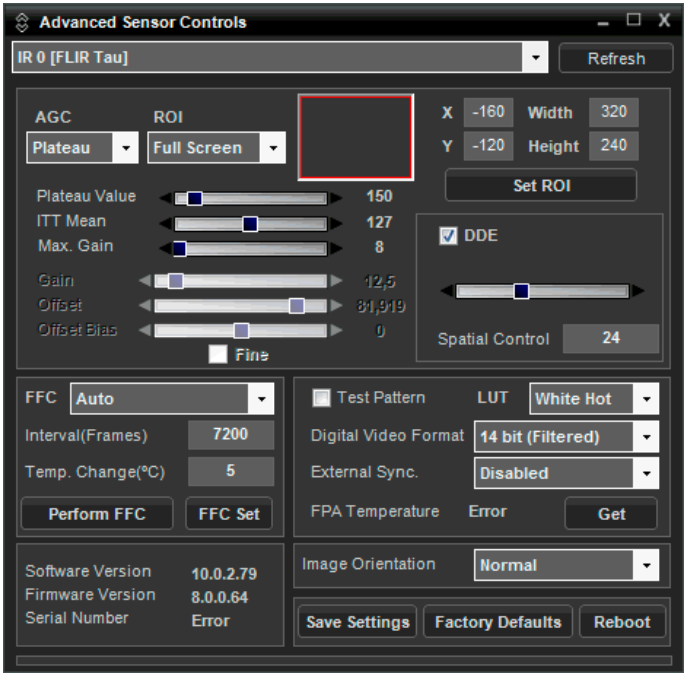
The Advanced Sensor Controls manager allows accessing the devices advanced features. The advanced controls manager can be displayed by clicking on the View → Advanced Sensors Controls.



When a sensor is set as active, the drop down list is filled with its devices as shown below.

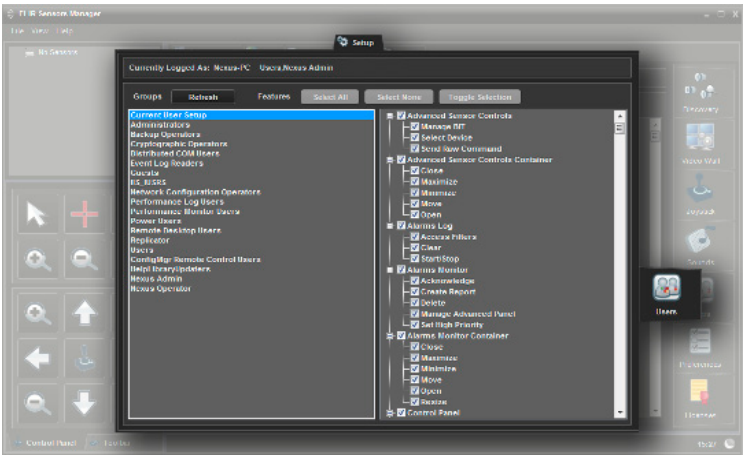

Advanced Sensor Controls
Refresh
DLTV 0 [VISCA DLTV]
GEO 0 [GEO]
IR 0 [FLIR Tau]
OSD 0 [OSD uFLIRish]
PT 0 [micro FLIRish P&T]
Video Source 0 [uFLIRish GD Video]
Video Source 1 [uFLIRish GD Video]
Video Source 2 [uFLIRish GD Video]
Video Source 3 [uFLIRish GD Video]

When a device is selected, its Advanced Sensors Controls panel is shown, if available. The layout and options of this panel may change depending on each device.



23 Users Management

FSM allows several to be customized for each user. The layout, preferences, profiles and permissions are all user characteristics. A security installation with several user layers such as Administrators and Operators with different privileges can be configured using FSM Users Manager.



This section explains how to work with User Permissions in FSM so different users can be present on the system having special permissions in each case.

Note: Administrator privileges are required in order to create and manage Windows Groups and Users.

23.1 User Permissions overview

FSM is a software tool that can be used by people with a wide variety of profiles. Usually Operators and Administrators are the two typical profiles to be configured.

The administrator profile usually has all the permissions so a user or group of users can manage all the capabilities in FSM. On the other hand, the operator profile, for example, would be a limited account or group of accounts with several restrictions while using FSM such as not being able to change any Video Wall setting or disabling the video analytics.

FSM groups are directly based on Windows groups, so in order to create different groups it will be needed to create them in Windows as shown in this document.

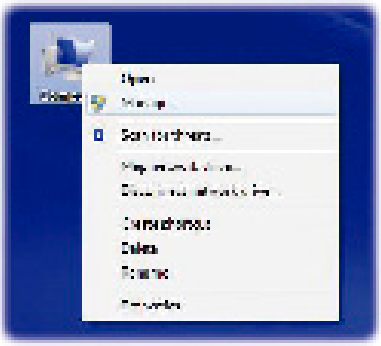
23.2 Working with Users and Groups in Windows

This section shows how to work with groups and users in Windows to leave the system ready to configure FSM properly.

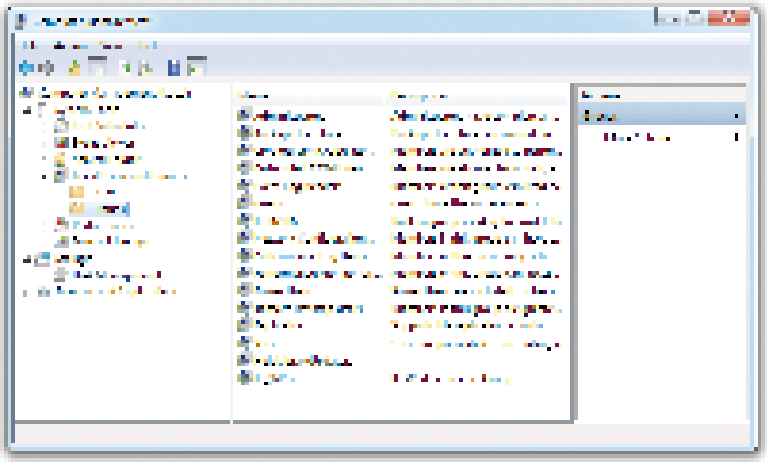
23.2.1 Setting up the Windows groups

Before starting to work with Users in FSM, some groups have to be added to Windows. To do so, follow these steps:

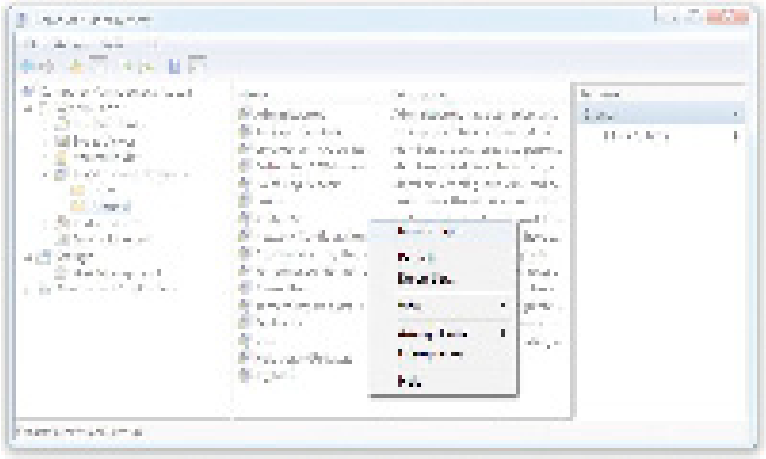
1 Right-click on Computer → Manage



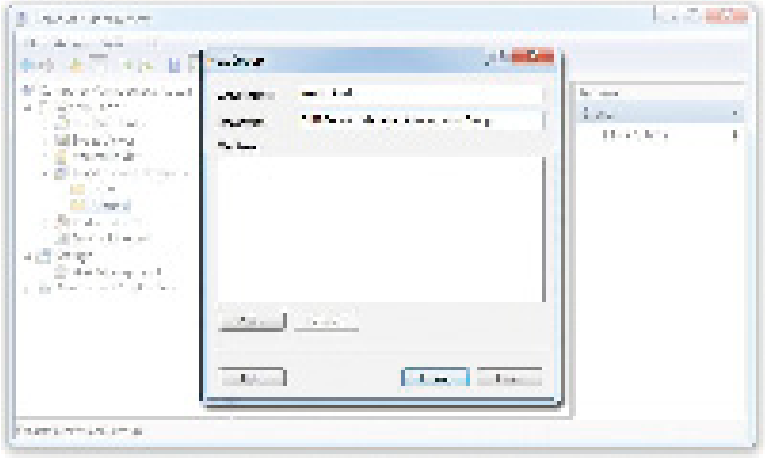
2 A new window entitled Computer Management will open. Select the Local Users and Groups → Groups option from the left hand side.



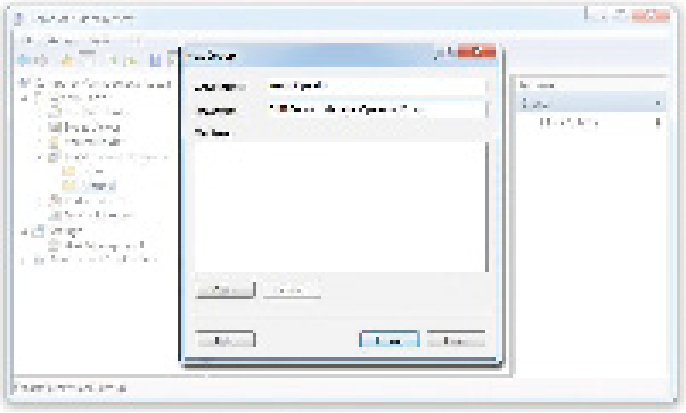
3 Right-click anywhere in the middle frame and select the New Group option.



4 Type “Nexus Admin” in the Group Name field. This name has to be typed exactly in this way. The Description field is optional, but recommended. Then click the Create button.



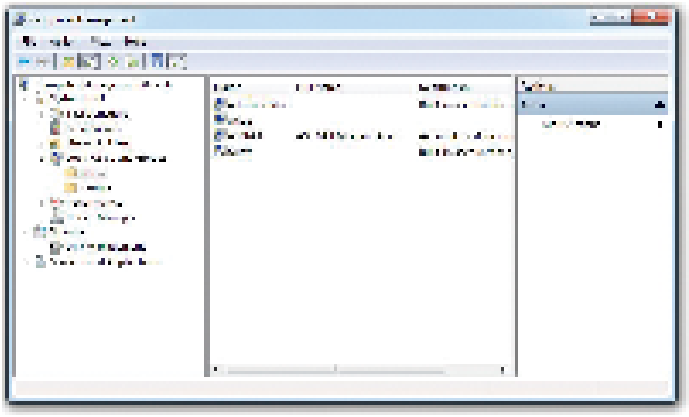
5 Once the administration group is created, the form will clear itself and get ready to create another group. In this case, the name of the group does not have to follow any rule. Nexus Operator has been chosen for this example. This will be the limited group on FSM. Then click on Create and Close.



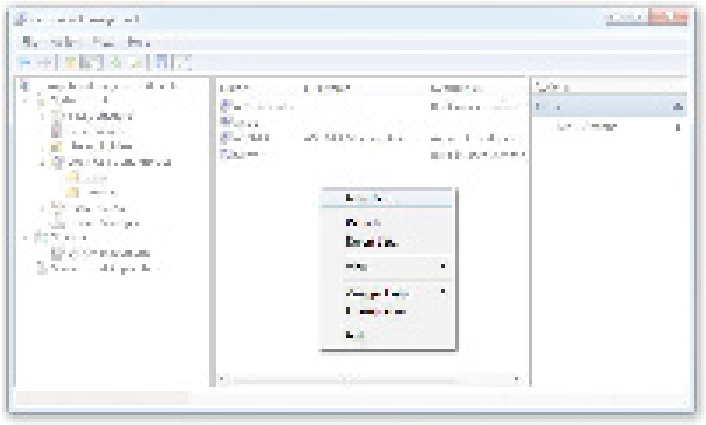
23.2.2 Creating Windows Users

Depending on how the operating system is configured, it will be necessary to create some users or not. This section is designed as if there were no usable users for this example so the administrator and user accounts will be created. If the system already has users that will perform as the needed accounts, this section can be ignored.

1 Select the Users folder from the left hand side on the Computer Management screen.



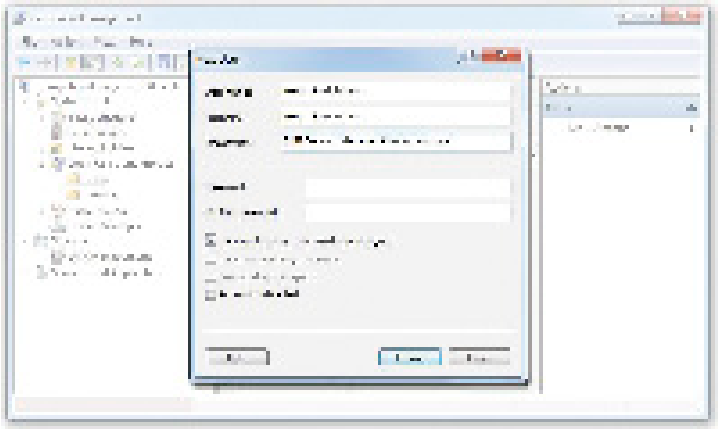
2 Right-click anywhere and select the New User option.



3 Give the user an appropriate name based on its role. In this case, the Nexus Administrator user is being created.

The Name string does not interfere on FSM functionality so any name can be assigned.

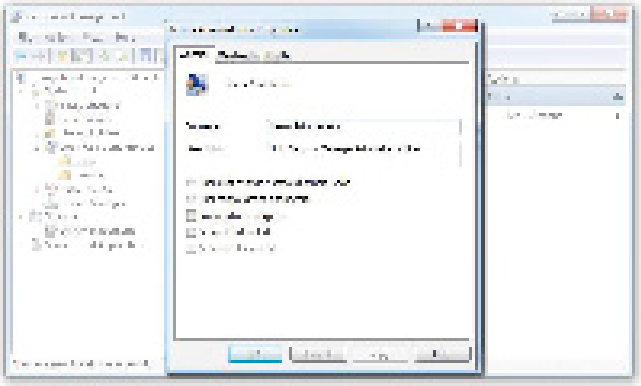
Repeat this step as many times as user are planned to be using FSM.



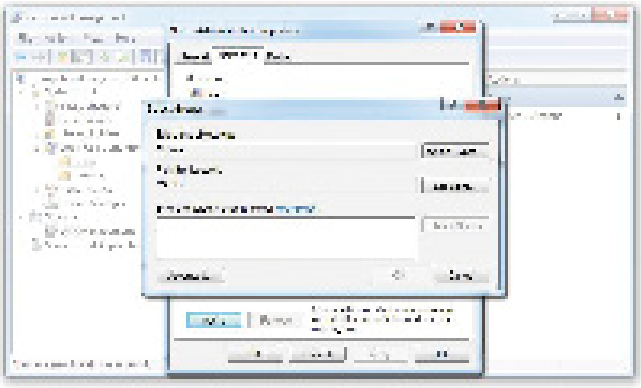
23.2.3 Changing users' membership

FSM does not look to individual users to assign permissions; it looks at users group instead, so it is very important to set up the right group memberships of all the users involved with FSM.

1 Select the Users folder and double click on one of the users present on the system. It is a good practice to start with the user that will play the administration role; in this case it is called Nexus Administrator.

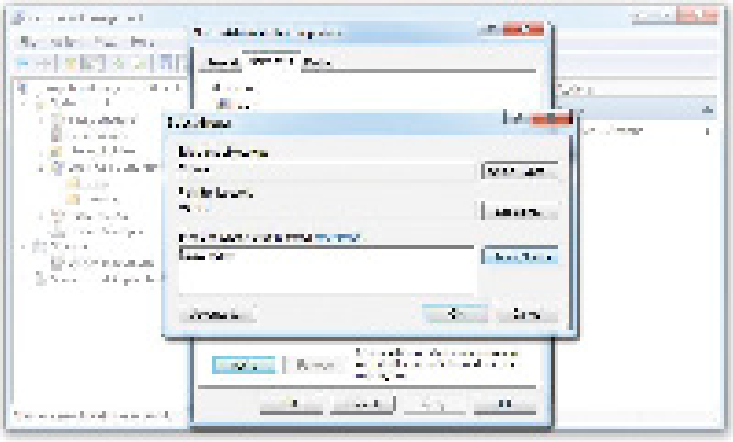


2 Click on the *Member Of* tab and then the *Add* button.



3 Subscribe this user to its corresponding group by typing the name of the group in the textbox, the click on Check Names to make sure the name is

right. In this case, the Nexus Administrator account will be member of the Nexus Admin group created in section 4.1.



4 Each user will need to belong to a certain group in order to assign different permissions in FSM. In this example two users have been created and assigned to two different groups.

Nexus Admin group

•Nexus Administrator

Nexus Operator group

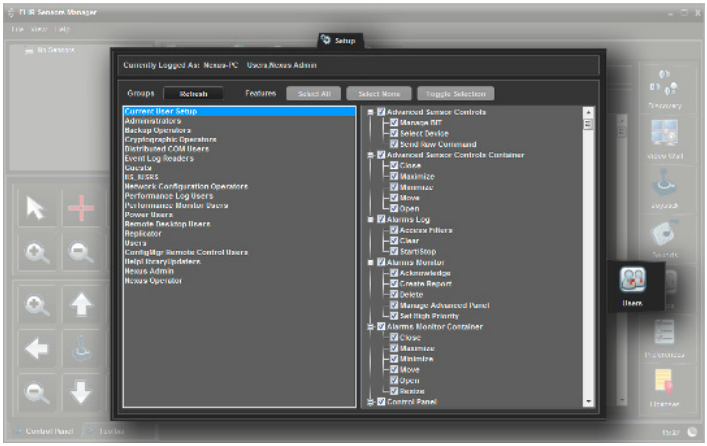
•Operator

Please, make sure to log off and log back in once all the users and user groups are created and assigned.

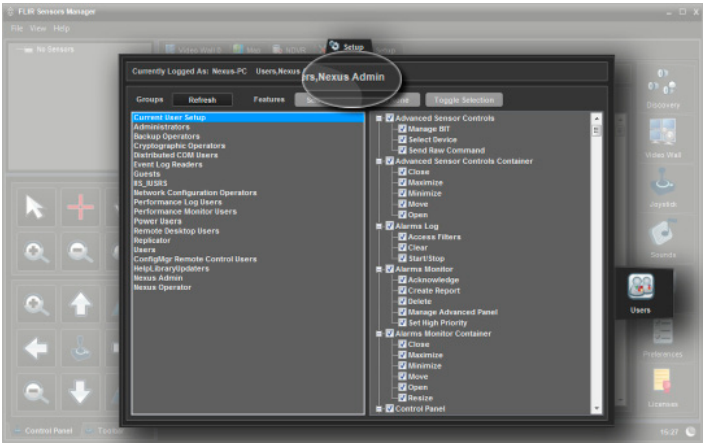
23.3 Assigning user permissions in FSM

Now that the system has the necessary users and groups, FSM can be opened and configured in order to provide each user group the right permissions. To start, log in Windows as the user member of the Nexus Admin group, in this case, the user called Nexus Administrator.

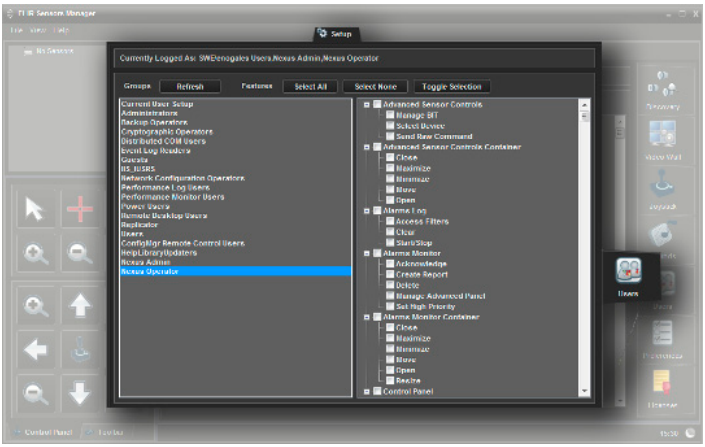
1 In FSM, user permissions are found in the Setup tab → Users.



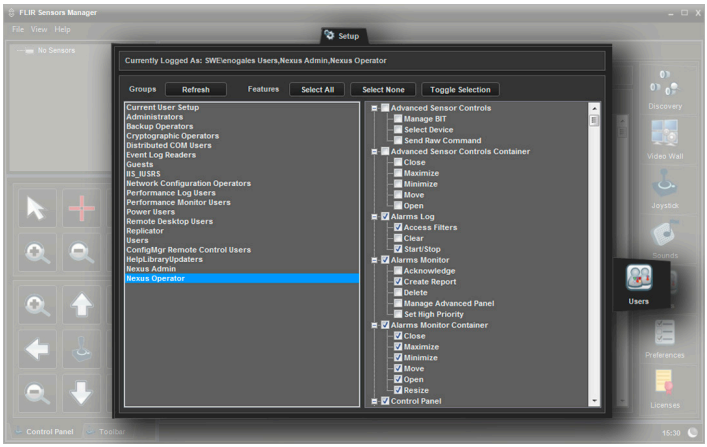
2 The line “Currently Logged As:” should contain the Nexus Admin group. If this is not part of the line, section 4 should be followed again.



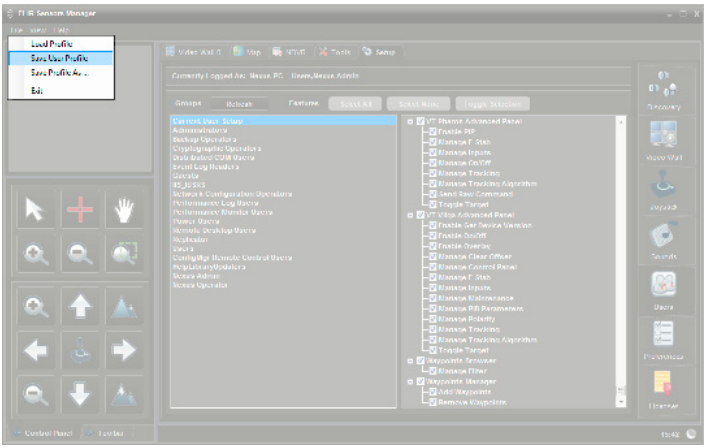
3 Select the Nexus Operator group. All the features should appear as unchecked. If any of those are checked, it is a good practice to start clicking the Select None button.



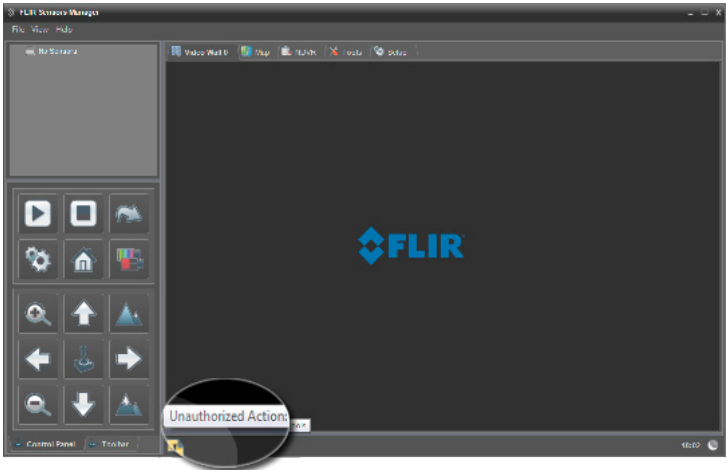
4 Now the system is ready to start giving permissions by checking the options from the Features list. Remember, in order to grant access to one of the functionalities in the features tree, the parent section should be checked.



5 Once all the user groups are set with the right permissions, simply click on File → Save Profile to save all changes permanently.

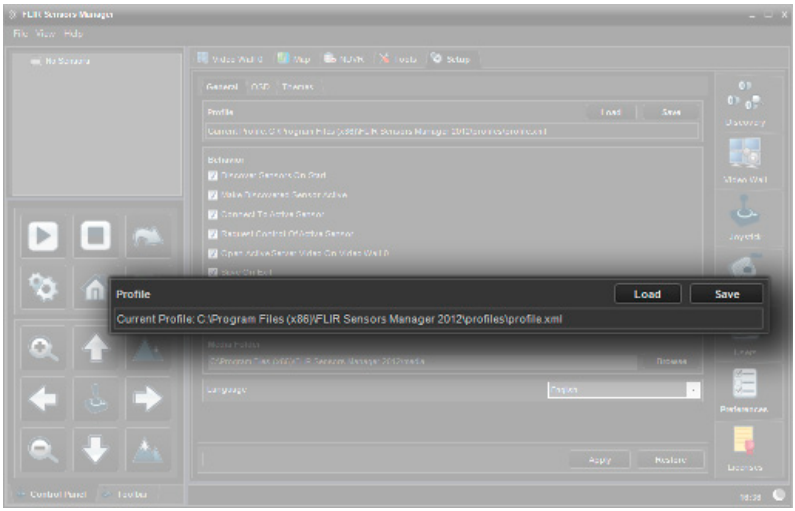


6 Now the Operator user can log in. When this user tries to access a functionality for which the permission has not been granted, a message will be shown in the Log informing about the unauthorized action.



24 FSM Profiles

FSM is able to save a customized layout as well as any user preference and language option. All these settings are saved in a file called Profile.
A profile can be loaded at any time either in the same computer where it was generated or a similar computer with a compatible version of FSM.
FSM Profiles are Windows User dependent, so a multiuser environment will end up having as many FSM Profiles as windows users



24.1 Saving a Profile

Profile data is saved in two different ways:

- **Save profile on exit:** When FSM is closed, it will save the current profile right before ending the application if the Save On Exit preference is active. A profile saved in this way will always become the default profile for the next time FSM is opened

- **Save profile manually:** The user can save the current profile at any time in two different ways:

a **Save User Profile:** This option will save the current profile (layout, preferences, sounds, etc) as the default user Profile. This means that every time this windows user opens FSM, the software will load the corresponding profile.

This option can be reached from File → Save User Profile.

b **Save Profile As:** Sometimes it will be required to save the current profile with a different name not making it the default user Profile. To do so, the profile should be saved either from the Save button in the Profile menu or form File → Save Profile As and giving it a different name than the user default profile.

24.2 Loading a profile

An FSM profile can be loaded at any time using the Load button from the Profile menu or going to File → Load Profile.

24.3 Default User Profile

As explained before, FSM profiles are windows user dependant, so each windows user will have its own FSM Profile file.

An FSM Profile file always keeps the same naming structure:

<Domain>_<UserName>_profile.xml

For example a Windows user named Daniel working in a domain called Office will have the default FSM User Profile Office_Daniel_profile.xml in the profile folder of FSM installation.

This file is automatically generated when the user opens FSM for the first time, so the use of these user profiles becomes natural and transparent for any FSM user.

25 Thermography Functions

This section contains a brief guide explaining how to test a brand new FLIR A-Series camera. Some basic network configuration knowledge is required in order to follow this section. Please contact a FLIR distributor in order to get more information in case of doubt.

25.1 Connecting the camera

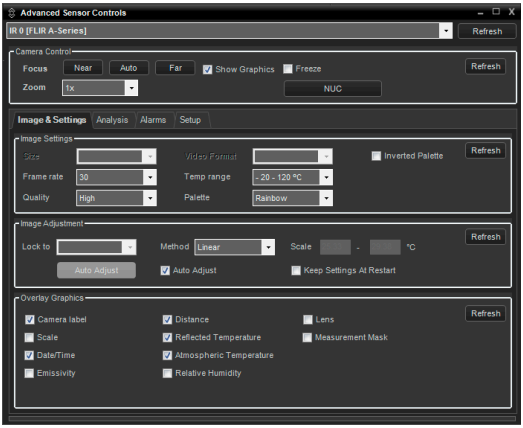
1 Power and video: Connect the power supply (12V/24V) and plug the video cable to a monitor to check if the camera is generating the appropriate video output.

2 Network: Plug the camera to a computer using a crossed-over cable.

3 Computer: Configure the network card of the computer to be in the same IP range than the camera. The default IP of the camera is 192.168.250.116, so the computer could be 192.168.250.100.

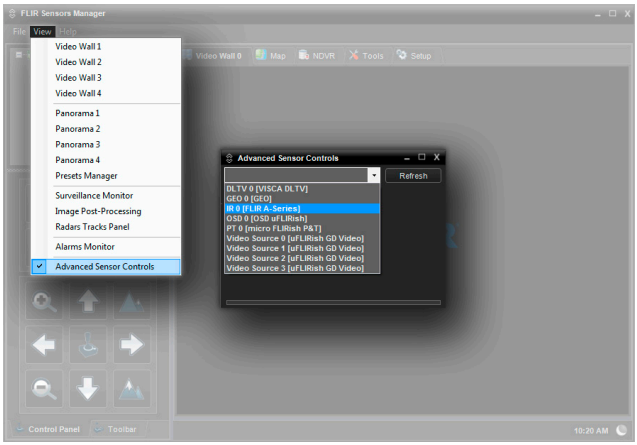
25.2 Advanced Sensor Controls panel

The Advanced Sensor Controls panel contains all the required settings to manage every aspect of the FLIR A-Series camera.



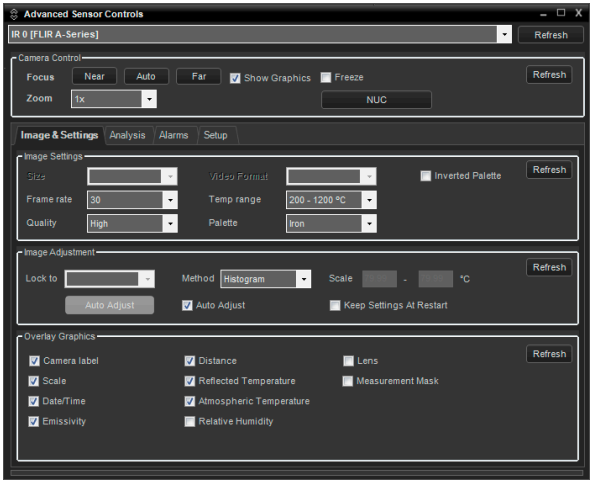
25.2.1 Accessing the Advanced Sensor Controls panel

To access this panel go to View → Advanced Sensor Controls and select IR 0 [FLIR A-Series].



25.2.2 Image and Settings tab

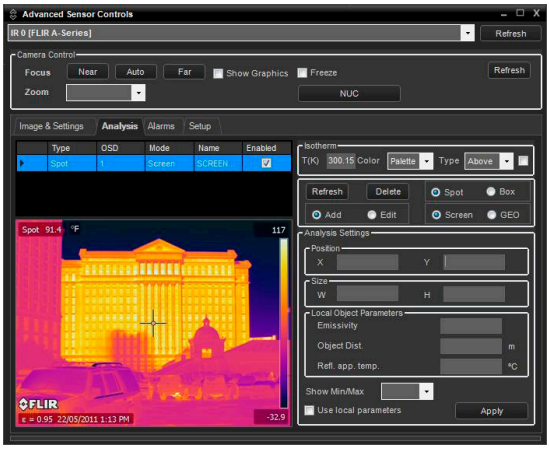
The Image and Settings tab contains all the controls relative to the video aspect and On Screen Display. Table 2 describes all this features.



Setting	Description
	Image Settings
Size	Sets the size of the streamed image.
Frame Rate	Sets the frame rate of the camera.
Quality	Sets the quality used for the video stream.
Video Format	Sets the video format for the encoder.
Temp. Range	Sets the Temperature range used on the camera.
Palette	Select the palette used on the IR video.
Inverted Palette	Inverts the IR color look up table.
	Image Adjustment
Lock to	Defines whether the temperature scale should be locked to the image or the temperature.
One-Shot Adjust	Triggers the auto-configuration of the camera involving image adjustment and Non Uniformity Correction
Method	Defines which algorithm will be used for image adjustments. The most suitable algorithm for a certain imaging situation depends on factors such as the target temperature and its emissivity. The user should test different algorithms in order to find the most appropriate one for each situation
Auto-Adjust	The camera adjusts for best contrast and brightness.
Scale	These values will be used as a basis for the auto adjustments.
Keep settings at restart	Settings will be saved and used when the camera restarts.
	Overlay Graphics
Camera Label	Shows the name of the camera.
Scale	Shows the scale used.
Date/Time	Shows the date and time.
Emissivity	Shows the emissivity parameter.
Distance	Shows the estimated distance.
Reflected Temperature	Shows the reflected temperature parameter.
Atmospheric Temperature	Shows the atmospheric temperature.
Relative Humidity	Shows the relative humidity.
Lens	Shows the lens Field Of View.
Measurement Mask	Makes use of the current measurement mask.

25.2.3 Analysis tab

This tab shows all the controls relative to the image analysis performed locally in the camera.

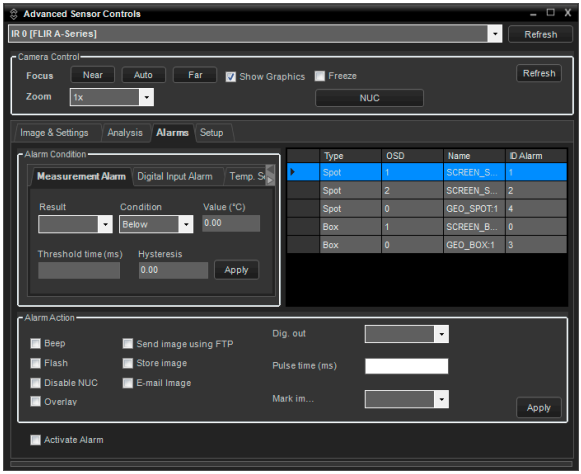


Setting	Description
Summary table	Contains information from all the spots and boxes being analyzed.
Image preview	Displays a single fixed frame to help creating the spots and areas.
	Isotherm
T(K)	Temperature range, in Kelvin, to be used for the Isotherm calculations.
Color	Color scheme to be used for the isotherm representation.
Type	Isotherm representation: Below, Internal or Above.
Checkbox	Apply changes on the isotherm configuration.
	Spot and Box Management
Refresh	Gets a new frame.
Delete	Deletes the selected spot/box from the Summary table.
Add – Edit	Adds a new point or Edits the selected one.
Spot – Box	Switches between Spot and Box to add a new instance.

Setting	Description
Screen - Geo	Switches between Screen and Geo spot/box. A Screen spot/box is a measurement point/area which position corresponds with its pixel location, therefore its place on the video will remain, no matter where the Pan and Tilt is pointing. A Geo spot/box is linked to the actual location of the chosen point/area. This spot/box will always be placed at the same physical position, so its pixel location will be recalculated every time the Pan, Tilt or Zoom values change.
	Analysis Settings
Position	Represents the pixel (X/Y) location of the measurement.
Size	Size in pixels of the box.
	Local Object Parameters
Emissivity	Emissivity value of the current spot/box.
Object Distance	Estimated distance to the object being measured by the current spot/box.
Reference Temperature	Refers to the reference temperature.

25.2.4 Alarms tab

Local alarms generated from the camera can be managed from this panel.



Setting	Description
	Alarm Condition
Measurement Alarm	
Result	Indicates which type of result from the analysis tool will be used to trigger the alarm.
Condition	Refers to the condition that will trigger the alarm.
Value	Value to be used with the previous condition.
Threshold Time (ms)	Specifies the elapsed time between the condition occurs and the alarm is triggered
Hysteresis	Refers the interval within which the temperature value is allowed to vary without causing a change in the triggered alarm. If the threshold is set above 30.00°C and the hysteresis is set at 2.00°C, the alarm will go high when the temperature rises above 30° and stays until it drops below 28°.
Digital Input Alarm	This panel allows managing the digital inputs
	Temperature Sensor alarm
Enable	Enables the Temperature alarm
Condition Above	When checked, the alarm triggers at a temperature above the set value. When not checked, the alarm triggers at a temperature below the set value.
Value	Value used to calculate the alarm trigger.
Duration	Specifies the elapsed time between the condition occurs and the alarm is triggered.
Hysteresis	Refers the interval within which the temperature value is allowed to vary without causing a change in the triggered alarm. If the threshold is set above 30.00°C and the hysteresis is set at 2.00°C, the alarm will go high when the temperature rises above 30° and stays until it drops below 28°.
	Alarm Action
Disable NUC	Disables the automatic NUC.
Store Image	Saves a picture in the internal memory when an alarm is triggered.
Send Image Using FTP	Sends the taken picture to a predefine FTP Server.
E-mail image	Sends the taken picture to an email address.
Digital Output	Associates the alarm with one three available digital outputs.
Pulse Time (ms)	Defines the pulse length in ms. A value of 0 will make it bi-stable.
Mark Image	Refers to which tag should be inserted in the image stream.

APPENDIX A. Shortcuts

Situation	Shortcut	Description
SPLASHSCREEN	Ctrl + F	Ignore profile on load
MAIN WINDOW	Ctrl + M	Toggle main menu
ALL WINDOWS	Ctrl + T	Toggle title barA
CURSOR MODES (Map, Video Wall and Panorama windows)	A	Arrow cursor mode (no action)
	H	Hand cursor mode (pan)
	R	Reticule cursor mode (aim)
	Z/Shift + Z	Zoom in/out cursor mode (continuous zoom on mouse down, stop on mouse up for the video)
VIDEO WALL	Ctrl + F	Mouse double-click: full screen
	Esc	Exit full screen
MAP	Mouse Wheel	Zoom in/zoom out
	Ctrl + mouse wheel	Pan horizontal
	Shift + mouse wheel	Pan vertically
	Alt + Mouse Wheel or Ctrl + R	Rotate map right
	Alt + Mouse Wheel or Ctrl + Shift + R	Rotate map left
	Ctrl+N	Reset rotation
	B/ Shift + B	Map opacity
PANORAMA	Mouse double click	Aim (regardless of the cursor mode)